The RUBBER AGE

May, 1943

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TARZAC

A

PLASTICIZER

for Oil Resistant Synthetic Rubbers

CAN AID YOUR SPECIFICATION WORK

TARZAC

plasticizes and smoothes permanently the oil resistant synthetic rubbers, giving high tensile and elongation.

TARZAC

extraction in solvents is small at room or elevated temperatures.

TARZAC

has low volatility at mixing temperatures—contributes to better mill room working conditions.

TARZAC

compounds have small volume change on heat aging.

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R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

Newsletter No. 5
MAY, 1943
Published by Rubber Chemicals Division of DUPONT

Reclaimed Rubber Production Increased - Quality Improved by Use of RPA No. 3

OUR scrap piles have become one of the most valuable sources of the nation's most important raw material, rubber. Consequently, the processing of scrap rubber into suitable rubber reclaim so that it can be re-used in our all-out war effort has become one of our most important national industries. RPA No. 3 is an active plasticizer or peptizer for vulcanized rubber. In the manufacture of reclaimed rubber it has three important and valuable functions:

(1) RPA No. 3 speeds up the devulcanization process thereby increasing plant capacity.

(2) RPA No. 3 softens the reclaim chemically thus reducing materially the amount of labor and power required.

(3) RPA No. 3-peptized reclaim is smoother, softer, and generally better processing than reclaim made from similar scrap rubber without RPA No. 3.

PAN RECLAIM PROCESS For scrap containing no cotton fabric a pan-reclaiming process using RPA No. 3 is very efficient. Ground inner tube scrap was mixed with various quantities of PPA No. 3 in an enamelled pan and heated in open steam at 80 lbs. per sq. in. pressure for 18 hours. The peptizing effect of the RPA is illustrated by the data in Table I.

TABLE 1

Peptizing Effect of RPA No. 3 on Inner Tube Scrap Reclaimed by the Pan Process

RPA No. 3 Per Cent on Scrap	Chloroform Extract—Per Cent	Increase in Devulcanization
Control 0.	12.	—
0.15	13.	8%
0.3	16.	33
0.7	18.	50
1.4	21.	75
2.8	24.	100

The use of RPA No. 3 greatly accelerates the devulcanization process, reducing the time required to produce a reclaim of given quality by as much as 50%.

ALKALI RECLAIM PROCESS In the presence of carbon black, alkali retards the peptizing action of RPA No. 3 and reduces its efficiency. For this reason it is impractical to add the RPA and alkali at the same stage of the process in reclaiming whole-tire scrap. Three practical methods of avoiding this difficulty are suggested:

(1) The peptizing agent may be added to the ground scrap and the mixture preheated in the autoclave before adding the alkali. The results of following this type of process are shown by the data in Table II comparing the increase in devulcanization (based on chloroform extract) when various amounts of RPA No. 3 are used. The mixtures containing 150 parts of ground scrap, 350 parts of water and the peptizer were preheated in an autoclave for 12 hours at 180°C. After cooling, sodium hydroxide was added to make a 5% solution and the mixture was given another 12 hours treatment at 180°C. The resulting material was washed free of caustic, dried and sheeted out as reclaimed rubber.

TABLE 2

Effect of RPA No. 3 on Devulcanization of Rubber Scrap in Alkali Process

RPA No. 3 Per Cent on Scrap	Chloroform Extract—Per Cent	Increase in Devulcanization
Control 0.	13.4	—
0.15	15.2	13%
0.3	17.8	33
0.7	21.75	62
1.4	20.05	50
2.8	19.1	42

(2) The peptizing agent may be added after the rubber scrap has been alkali-digested in the autoclave, washed and dried. The RPA No. 3 will exert its peptizing effect and materially soften and smooth out the reclaim due to heat built up during the refining, straining and sheeting operations. This process may be the most practicable since it involves no adjustment of the initial steps in the alkali process and merely necessitates the addition of RPA No. 3 at the drier exit. Its use at this stage will enable the manufacturer to obtain reclaim of the same quality with reduced power consumption and processing time, or a smoother, softer product with the usual time cycle.

(3) Where conditions warrant, it may be most practical to peel the tread from the carcass, reclaiming it by use of a modified pan or digester process in which about 0.25% RPA No. 3 is added to the tread scrap. The carcass, containing little black may be reclaimed by an alkali-RPA No. 3 process. The two reclaims may be blended prior to refining to produce whole-tire reclaim.

TIME will be saved if mail and samples intended for the staff of the Rubber Laboratory are addressed:

E. I. du Pont de Nemours & Co.
P. O. Box 525
Wilmington, Delaware

PRIORITIES— Preference rating certification or formal priority information must accompany all orders for the following chemicals:

Accelerator No. 8
Accelerator 833
Acrin
Aquarex MDL Paste
Heliozone
Retarder W

In order to avoid unnecessary delay in filling orders, please be sure all orders for these materials are accompanied by the necessary priority information presented in the form prescribed by the War Production Board for the particular rating under which you are operating.

HELIOZONE is a sun-checking resistor for rubber, reclaimed rubber, and Buna S compounds. Use it to obtain better surface finish and appearance as well as for sun-checking resistance.

GRANULAR 60% SODIUM ACETATE —Inquiries regarding, or orders for this material should be sent to:

E. I. du Pont de Nemours & Co.
Electrochemicals Department
Miscellaneous Sales Division
Empire State Building
New York, New York

or

E. I. du Pont de Nemours & Co.
Grasselli Chemicals Department
Wilmington, Delaware

DUPONT
RUBBER CHEMICALS DIVISION
BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

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FOR LOW TEMPERATURE FLEXIBILITY

Hycar OR-25

An important new type of *Synthetic Rubber*

Typical Compounds of Hycar OR-25 for Low-Temperature Service

	1601-HCR-8	1601-HCR-10	1601-HCR-12	1601-HCR-14	1601-HCR-16
Hycar OR-25	100	100	100	75	100
Hycar OS-10	.....	.....	.....	25	.....
Zinc oxide	5	5	5	5	5
Stearic acid	0.5	0.5	0.5	1	0.5
‡1107-HCR-88	6	2	.....	2	2
Benzothiazyl disulfide	1.5	1.5	3	1.5	1.5
Tetrone A	.....	0.75	.....	0.75	0.75
Tetramethyl-thiuram disulfide	.....	.....	3	.....	.....
Plasticizer SC	15	15	15	15	15
Tributoxy ethyl phosphate	15	15	15	15	15
*Semi-reinforcing black	70	70	70	70	.....
Channel black	.....	.....	.....	.....	40
Fine ground whiting	.....	.....	.....	.....	40
	213	209.75	211.5	210.25	219.75

Physical Properties of the Vulcanizate

Original					
Min. Cure at 310°F.	30	30	30	30	30
Modulus at 300%	1500	1700	690	1400	600
Ultimate Tensile	2350	2310	1800	1850	1720
Ultimate Elongation	445	415	620	400	500
Tensile Sheet Hardness	52	54	49	54	54
Flexible to °F (loop Method)	—76	—68	—68	—68	—76
Brittle at °F (loop Method)	—104	—104	—94	—94	—94
SAE-ASTM parallel bend test					
5 hours at —40°F.	OK	OK	OK	OK	OK
5 hours at —65°F.	OK	OK	OK	OK	OK
Sp. Gr.	1.20	1.20	1.20	1.20	1.27
½ Inch Disc Cured at 310°F for 60 Minutes					
Shore Hardness	53	54	47	53	52
% Lupke Rebound	75	75	74	74	69
% Comp. Set ASTM Method B	8	4	10**15†	7	13
% Comp. Set 70 hours at 212°F.	55	36	40**55†	32	45
Aged in Air Oven 70 hours at 212°F					
Ultimate Tensile	2650	2350	2250	2100	1780
Ultimate Elongation	275	285	355	285	345
Shore Hardness	61	63	61	64	63
180° Bend	OK	OK	OK	OK	OK
Immersed in ASTM-SAE Oil (Aniline point 159°F) 70 hours at 212°F					
Ultimate Tensile	2350	1880	1950	1400	1760
Ultimate Elongation	340	280	450	275	375
Shore Hardness	59	58	51	50	55
% Volume Change	—1	+0.8	+0.8	+20	+2
Immersed in AN-VV-O-366 Oil (Aniline point 189°F) 70 hours at 212°F					
Ultimate Tensile	2520	2200	2100	1590	1650
Ultimate Elongation	305	305	410	270	365
Shore Hardness	62	60	60	54	58
% Volume Change	—5	—3	—6	+12	—10
Immersed in Paraffin Lub Oil (Aniline point 230°F) 70 hours at 212°F					
Ultimate Tensile	2920	2900	2550	2125	1700
Ultimate Elongation	335	340	455	315	385
Shore Hardness	62	60	66	65	62
% Volume Change	—5	—3	—12	—7	—13
Immersed in 100 Octane Gasoline 70 hours at Room Temperature					
Ultimate Tensile	2120	1920	1700	1510	1590
Ultimate Elongation	385	360	600	310	455
Shore Hardness	53	54	47	51	51
% Volume Change	+1	+1	+1	+6	+0.7
Immersed in 100 Octane Gasoline with 40% Aromatics 70 hours at Room Temperature					
Ultimate Tensile	1250	950	950	600	450
Ultimate Elongation	285	215	400	170	265
Shore Hardness	44	50	35	45	44
% Volume Change	+21	+22	+24	+48	+19

* Gastex used in these recipes.
** Deflection 30%.
† Deflection 40%.

‡1107-HCR-88 Sulfur Masterbatch.

HYCAR OR-15	100
Channel black	50
Ground Sulfur	50
	200

RUBBER FABRICATORS who must meet aeronautical specifications requiring low-temperature flexibility now have available to them a new Hycar, especially designed for this exacting service.

Products manufactured from Hycar OR-25 not only possess excellent low-temperature flexibility, but also have other vitally important characteristics, as shown in the accompanying table.

For over 9 months prior to its release limited quantities were produced, enabling us to stabilize methods of manufacture and assure you of a uniform material. These limited quantities were used in a critical war application in which the product gave excellent performance.

With manufacturing technique established and field performance proven, we now make OR-25 generally available with full confidence in its superior characteristics and ease of compounding and processing.

EXPERIMENTAL QUANTITIES

The Office of Rubber Director has authorized us to set aside a limited quantity of this new product, which may be sold in amounts up to 25 pounds for experimental work, without allocation. We suggest that you place your orders at once.

HYCAR CHEMICAL COMPANY

AKRON, OHIO

Outstanding NEW USE

for a LONG-ESTABLISHED PRODUCT

AC

PARRAS

Washed and Dried

GUAYULE

TACKIFIER and EXTENDER for

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A Good Pair . . .

BUNA S and NAFTOLEN

REG. U. S. PAT. OFFICE

Both Buna S and Naftolen are unsaturated hydrocarbons and as such they are compatible in all proportions. If you want to plasticize, tackify or extend your Buna S, the use of Naftolen may offer a ready solution to your processing and compounding problems. We suggest that you try 25 to 100 parts of Naftolen on 100 parts of Buna S, using 2% sulfur on the synthetic rubber plus 2 to 3% on the Naftolen. An added amount of filler, in proportion to the amount of Naftolen used, is indicated. Naftolen has also found wide application in reclaimed rubber, natural rubber, neoprene and Buna N.

WILMINGTON CHEMICAL CORPORATION

10 East 40th St. — **New York, N. Y.**

Plant and Laboratory: — ***Wilmington, Delaware***

Do You See Spots Before Your Eyes When Examining Your Present Liners?

The CAPITOL PROCESS LINER TREATMENT *prevents those little dabs of rubber from clinging to liners,* causing spoilage of valuable materials and waste of time and money.

It is a proven process that is steadily winning new friends, because it actually prevents adhesions, accelerates separation and, by preserving the life of cotton fabrics, decreases necessary purchases of new cotton piece goods. It combines effectiveness with economy.

Send us a 50- or 100-yard liner and we will treat it gratis for testing in your own plant. We believe you will like the results.

TEXTILE PROOFERS, INC.

181-193 Culver Ave., Jersey City, N. J.

Originators of the Capitol Process Liner Treatment

The man who invented the sausage grinder

WOULD NEVER KNOW IT NOW

FOR centuries they had been chopping meat for sausages with knives and cleavers. Then one day an adventurous fellow turned up with a meat grinder, requiring no knives or chopping blocks—you just turned a crank.

The world has never been quite the same since. For the first sausage grinder opened the way for a long line of screw-feed mechanisms, from the coal stoker in your basement to the big rubber strainer shown above.

National has been designing and building rubber extruders, or tubing machines, for many years. For the past several years we also have developed, built and installed machines for extruding plastics—more of them than all other manufacturers combined.

From our experience with plastics extrusion we have learned new and important facts that apply to rubber as well. This new knowledge, thoroughly tested and proved, has been incorporated in the design and improved performance of the National tubing machines available today to the rubber industry.

NATIONAL RUBBER MACHINERY COMPANY

General Offices: Akron, Ohio

CREATIVE ENGINEERING

An Important Decision on Synthetic Rubber for Tires

For more than a year this company's Buna rubber patents have been royalty-free to everybody for the duration of the war. On April 15, 1943 we offered, subject to the approval of our stockholders, to transfer *permanently* to the U. S. Government (through the Government's Rubber Reserve Company) patent rights on Buna-S . . . the tire rubber which forms the basis of the Government's synthetic rubber program. The Government's Rubber Director and Rubber Reserve Company have accepted this proposal. This is the first time, to our knowledge, that any company has offered to Government the right to license important patents—royalty-free—forever—to everyone—even to its competitors.

UNDER THE PROPOSAL:

1. The Government will have a free license for itself not only during the war, but for the entire life of the patents.
2. During the war the Government will have the right to issue royalty-free licenses for the entire life of the patents to everyone who cooperates with the Government in its war rubber program and reciprocates with similar licenses under its own patents.
3. There will be no payments to us or to others for the patent rights used.
4. The Government will increase its expenditures on synthetic rubber research to a total of not less than $5,000,000.

OUR PURPOSES:

1. To give every possible incentive to cooperation in the war rubber program.
2. To remove concern about the post-war patent situation from the minds of all those who have a contribution to make to this program.
3. To encourage American research and ingenuity—among independent workers, small companies and large—to build up a new and great American industry.
4. To continue to do everything we can to assure tires for America's cars—*always*.

FACTS ABOUT BUNA

In 1929 we bought from I. G. Farben-industrie of Germany a minor interest in their Buna rubber processes for use outside of Germany.

•

During the 1930's these processes were further developed. The quality of Buna was improved, the range of its use widened.

•

In 1939—two years before Pearl Harbor—we bought out *all* German rights in the Buna processes for the U.S.A. Soon after, two large tire companies took out licenses. We also began building a Buna rubber plant of our own.

•

When war threatened the loss of our country's natural rubber supply, authorities agreed that Buna-S was America's best bet for tires. It became the basis of the Government's synthetic tire program.

•

Today the Government is spending over six hundred million dollars on its Buna-S program. Six rubber plants are in operation. By the end of 1943 completed plants will have a capacity of 705,000 tons per year, or more than the entire normal peace-time rubber requirements of th United States.

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(NEW JERSEY)

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To White Pigment Satisfaction
Whiteness and brightness still are the outstanding characteristics of TITANOX pigments. In addition they have high tinting strength. They are chemically stable in the presence of acids, alkalis and gases. They are chemically inert and highly resistant to after-yellowing.
Only titanium pigments, of which TITANOX pigments are the oldest and most widely used, possess all of these qualities.
TITANOX pigments may be depended upon to give unsurpassed results in the compounding of natural, reclaimed and synthetic rubber in which white pigments are used.
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All Ready . . .

to make Synthetics go farther, work better and improve quality - - -

EXTENDER 600

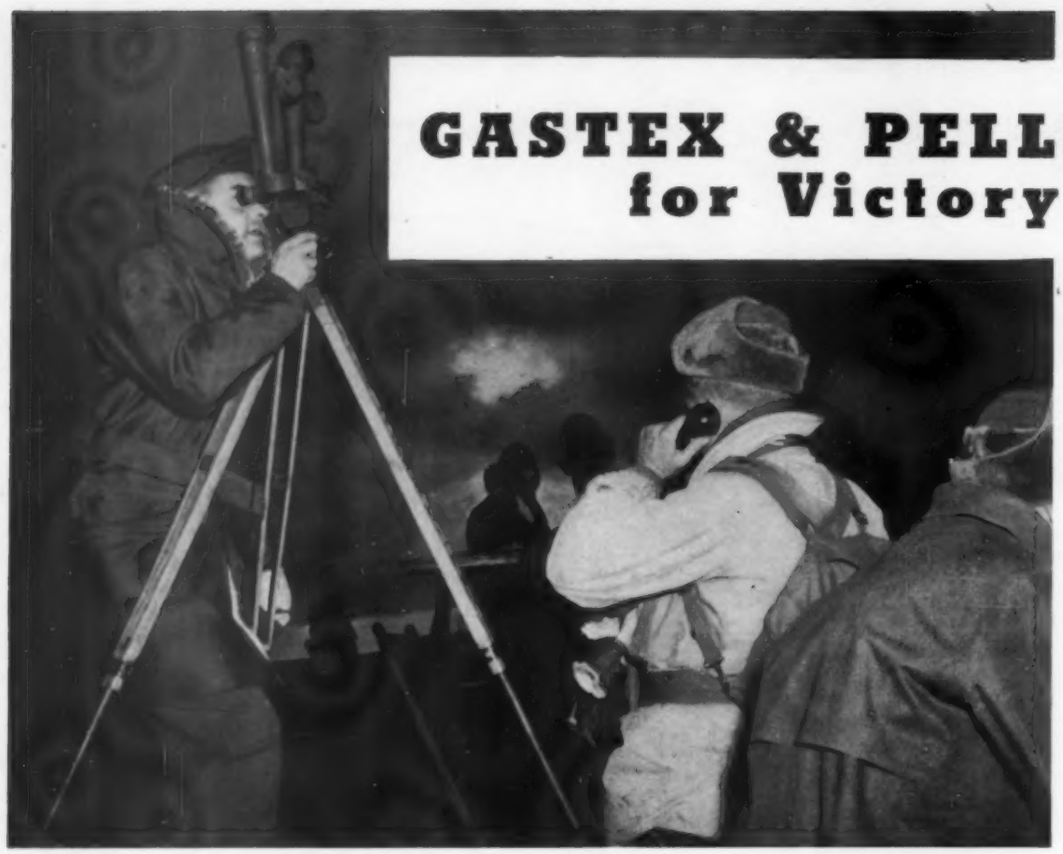
Are your plans ready to swing into production when the release of Synthetic comes? . . . Our plans are ready to help you extend effectively the Synthetic allocated to your plant. EXTENDER 600 is the *proved* medium for getting *more* production, *more* economy in the production cost and *more* of the important properties that improve product quality . . .

EXTENDER 600 is a special modified vegetable oil copolymer, that has already given ample proof of its great value in Synthetic compounding . . . It incorporates quickly, has a decided plasticizing action, improves tack, increases tensile and gives greater resistance to flex-cracking. It smoothes out compounds for better extrusion. IT WILL INCREASE PRODUCTION OUTPUT AS MUCH AS 50%. Write, wire or phone us now for full data and samples.

STANDARD

Chemical Company

AKRON SAVINGS AND LOAN BLDG. AKRON, OHIO



GASTEX & PELLETEX for Victory

PHOTO
U. S. ARMY
SIGNAL CORPS

Wire Jackets Compounded with GASTEX can "Take It."

No war assignment for rubber and synthetic compounds calls for greater stamina and toughness than wire jackets for field telephones and electric current service of the U. S. Army Signal Corps. The above photo taken in Iceland gives a faint idea of the exposure to weather and abrasion to which such wires are subjected.

One reason why the entire output of our two plants is now under Government allocation is because GASTEX and PELLETEX compounds form a sheath of high tensile strength which resists weather conditions, abrasion, and the action of grease and solvents.

Our Technical Staff is at your service in consideration of post-war developments.

HERRON BROS. & MEYER

OHIO BLDG., AKRON, OHIO.

GASTEX TRADE MARK

GENERAL SALES AGENTS FOR

GENERAL ATLAS CARBON DIVISION

OF GENERAL PROPERTIES COMPANY, INC.

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PELLETEX TRADE MARK

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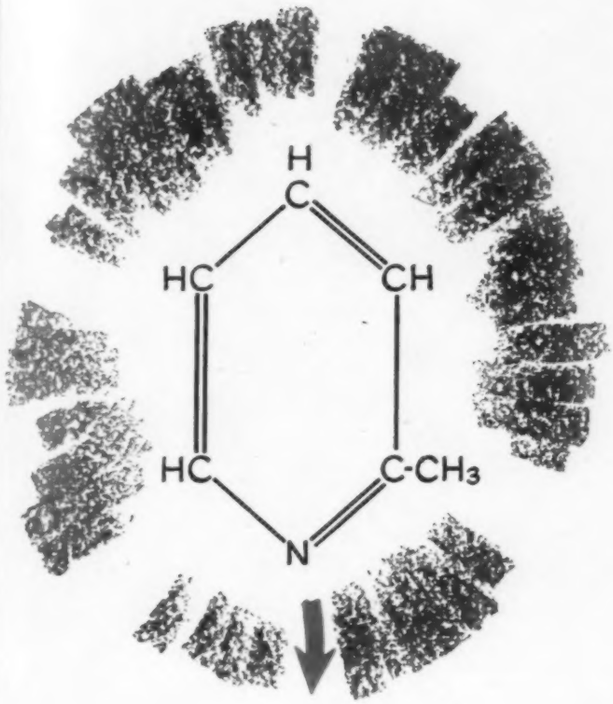
KOPPERS *alpha-Picoline*



Uses. The high water-solubility and the boiling point of alpha-picoline recommend it for many solvent uses in place of more expensive solvents, particularly where the use of a pure compound will reduce costs in comparison with wide boiling ranges of unknown compositions. Its use is suggested in the synthesis of alkaloids, pharmaceuticals and other organic compounds. Also as a starting material in the manufacture of rubber accelerators and anti-oxidants.

Properties. **(Pure Compound)**

Molecular Weight	93
Melting Point	—69.9°C.
Boiling Point	128°C.
Specific Gravity at 15°/4°C.	0.950

State: Liquid

Solubility: Very soluble in water and forms constant boiling mixture with it. Completely miscible with alcohol and with ethyl ether.

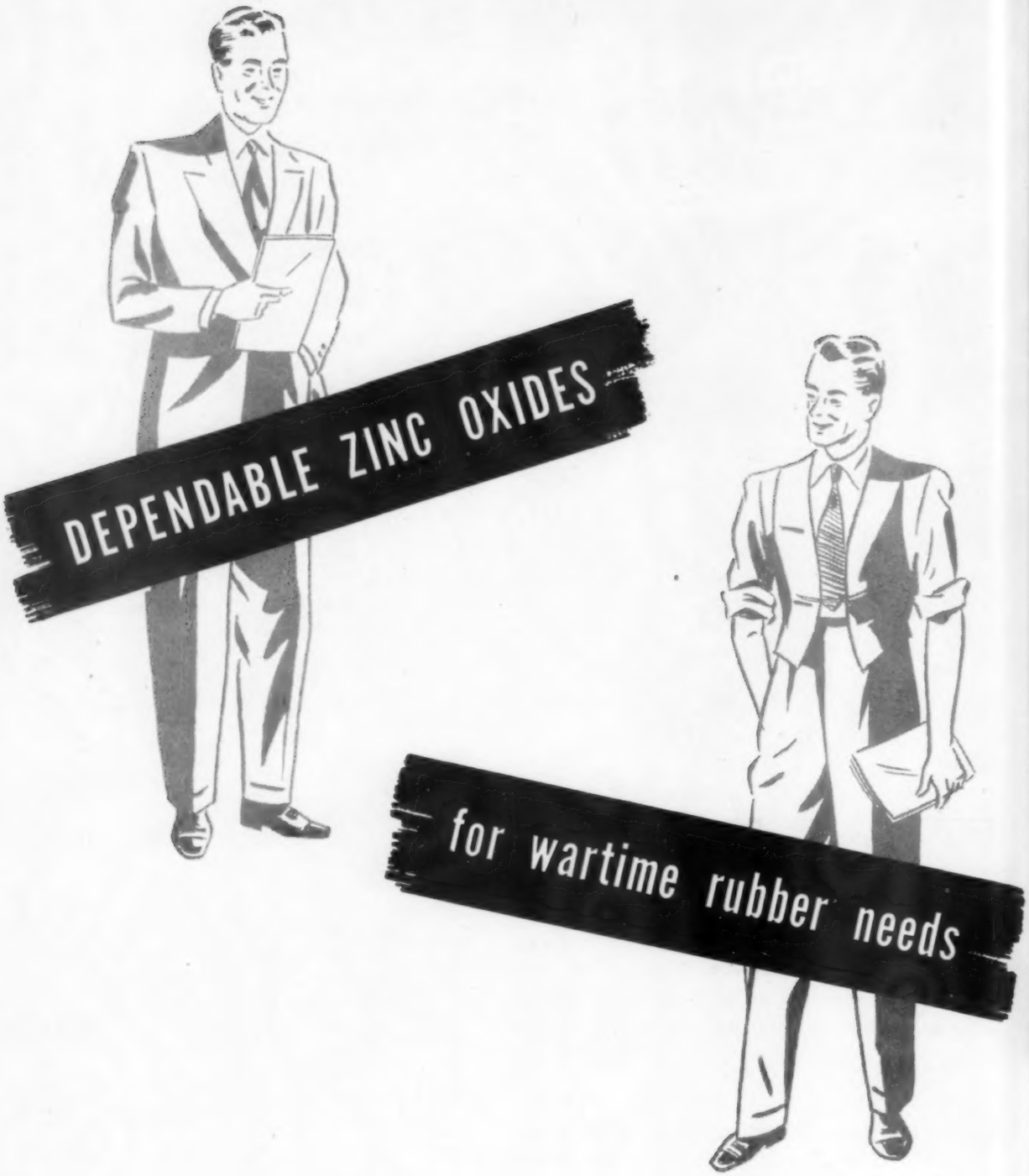
Available as 2° alpha picoline.

Koppers will also be glad to submit samples and prices on beta and gamma picolines and other tar bases, including 2° and denaturing pyridine, lutidines, quinoline and higher-boiling bases.

Koppers also supplies to the chemical industry: Tar acids, naphthalene, creosote, industrial pitches; coal for steam and for processing; coke for metallurgical use and for heating; coal processing systems; gas plants; gas purification systems; gas holders; valves; time cycle controls; anti-corrosive alloys; Fast's self-aligning couplings; piston rings for compressors, pumps, and steam and diesel engines; pressure-treated timber for damp and humid locations; coal tar roofing, waterproofing, dampproofing, industrial pitches.—Koppers Company and Affiliates, Pittsburgh, Pa.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY



AZO

ZINC OXIDES

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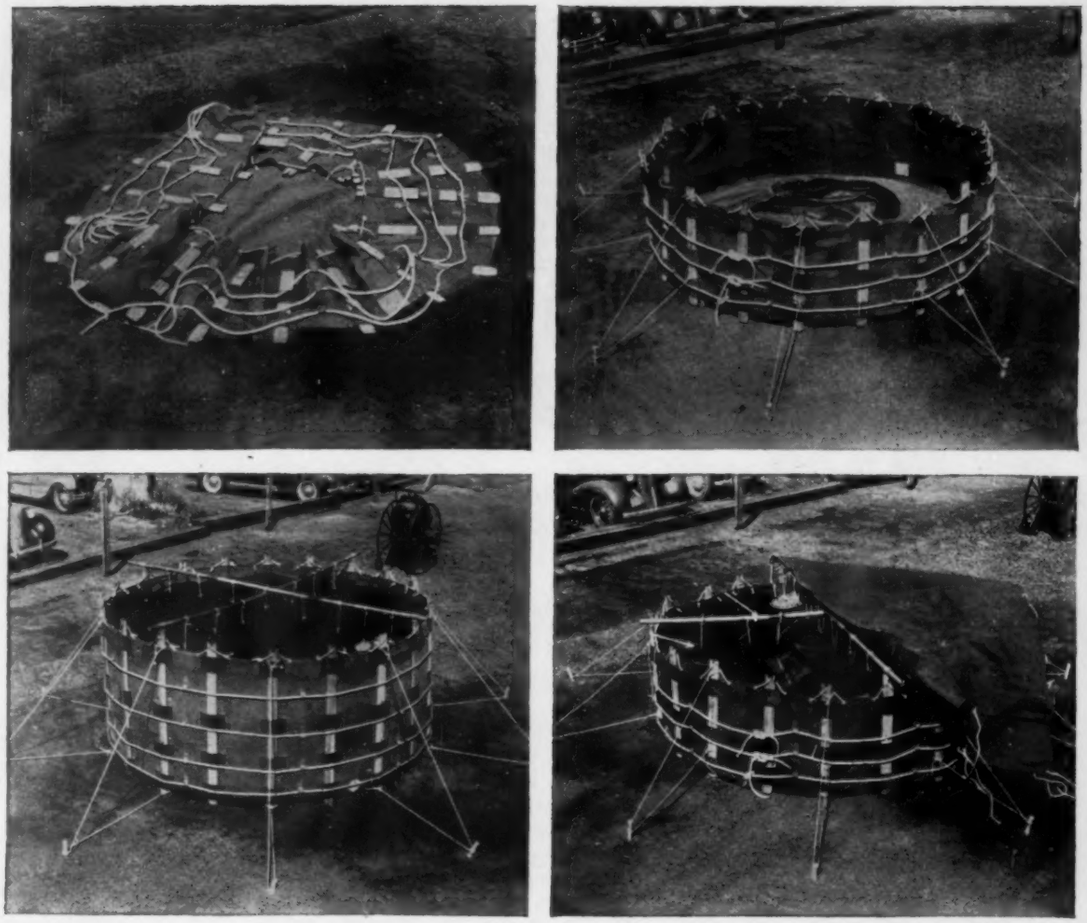

Gas Station . . . U. S. Army Style

THIOKOL* synthetic rubber "gas stations" that can be erected in a matter of minutes are playing a vital role in keeping front-line American tanks and planes supplied with precious fuel. Just as fast as our troops advance, these gas stations spring up behind them, and are immediately filled with from 500 to 10,000 gallons of gasoline or motor oil.

In addition to providing maximum mobility to our mechanized equipment, the Thiokol containers are saving vast quantities of shipping space. Even the largest size can be collapsed into a very small package for shipping overseas. Adoption of the containers, moreover, freed large quantities of steel for other important war uses.

Construction of the portable gas stations consists of a huge fuel-proof bladder fabricated from Thiokol synthetic rubber Type FA. This fits into a canvas supporting structure which is staked to the ground. The bladder serves to contain the fuel, while all physical stresses due to the weight and pressure of the gasoline or motor oil are taken up by the supporting structure.

An engineering material proved many years before Pearl Harbor, Thiokol synthetic rubber is helping us wage successful war on land, sea and in the air. Much new technical data on forms and applications of this synthetic have been amassed. If your work is war work, ask us for it.

Thiokol Corporation, Trenton, N. J.

*Thiokol Corporation, Trademark Reg. U. S. Pat. Off.

Thiokol*

SYNTHETIC RUBBER

"America's First"

A Grade For Every Purpose

ST. JOE Lead-Free **ZINC OXIDES** have been adopted by leading manufacturers in the rubber, paint and allied industries for this reason: The precise characteristics which consumers' requirements indicate as being most desirable for their respective products, can be readily imparted to our various grades. This is due to the flexibility of our patented Electro-Thermic Process, by means of which our zinc oxides are produced.

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MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

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TORITE

A Replacement for Rubber

TORITE is available in various forms—in solution for coatings and in tough rubber-like sheets which may be compounded, milled and vulcanized in the usual manner.

Suggested Uses

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Insulation
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PLASTICITE CHEMICALS CORPORATION

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IN GOVERNMENT SERVICE
FOR THE DURATION

But we'll be back after the war

NAUGATUCK CHEMICAL DIVISION

UNITED STATES RUBBER COMPANY

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PREPARED FOR THE STRAIN OF TOMORROW

DIXIEDENSED KOSMOBILE

DUSTLESS CARBON BLACKS

UNITED CARBON COMPANY · CHARLESTON, WEST VIRGINIA

DIXIEDENSED AND KOSMOBILE, THE "QUALITY TWINS"

OF THE RUBBER INDUSTRY, PRODUCE PRODUCTS THAT

ARE WELL PREPARED FOR THE STRAIN OF TOMORROW.

BRR-RR-R!

PERBUNAN

PERBUNAN

is the synthetic rubber that not only resists oil, but retains its flexibility to a remarkable degree at extremely low temperatures. For these reasons, the entire production of PERBUNAN is now used by our Armed Services.

Write STANCO DISTRIBUTORS, INC.
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WAREHOUSE STOCKS IN NEW JERSEY, LOUISIANA AND CALIFORNIA

Holding the Line in an Emergency

. . . . . They Are Doing a Darn Good Job for Uncle Sam

PEQUANOC RECLAIMS

PEQUANOC RUBBER CO.

QUALITY RECLAIMS FOR SPECIFIC PURPOSES

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Speaking of **"KNOW-HOW"** *Literature*

HERE'S A FACT PACKED ARMFUL

Read these Watson-Stillman Publications

Prepared to give YOU-THE-USER What You Need To Know About...

FITTINGS (Forged Steel Screwed and Welding) **VALVES** (Globe and Check) **HAND PUMPS**

All these products are available through mill supply distributors and the following descriptive literature is yours on request

Factual Data on Watson-Stillman Forged Steel Screwed and Socket Welding Fittings. Photographs. Diagrammatic Illustrations. Pressure Ratings. Dimension Tables. Engineering Tables. Piping Code Excerpts. Wall Thickness and Stress Calculations. Specifications. Pressure-Temperature Charts. Pipe Thread Dimension Tables. Fillet Weld Calculation Data. Steel Pipe Data. Water Discharge Table. BULLETIN A-3.

Factual Data on Watson-Stillman Valves for Hydraulic service including Bronze Globe Valves, Forged Steel Globe Valves, Bronze Check Valves, Forged Steel Check Valves, Valves with Screwed or Flanged Connections. Sectional Views, with indication of Flow. Pressure Ratings. Dimension Tables. BULLETIN A-4.

Factual Data on Watson-Stillman Hand Pumps including Single Plunger and Double Plunger Pumps, Pumps with large, medium or small tanks. Photographs. Dimension Tables. Pressure Ratings. BULLETIN 240-A.

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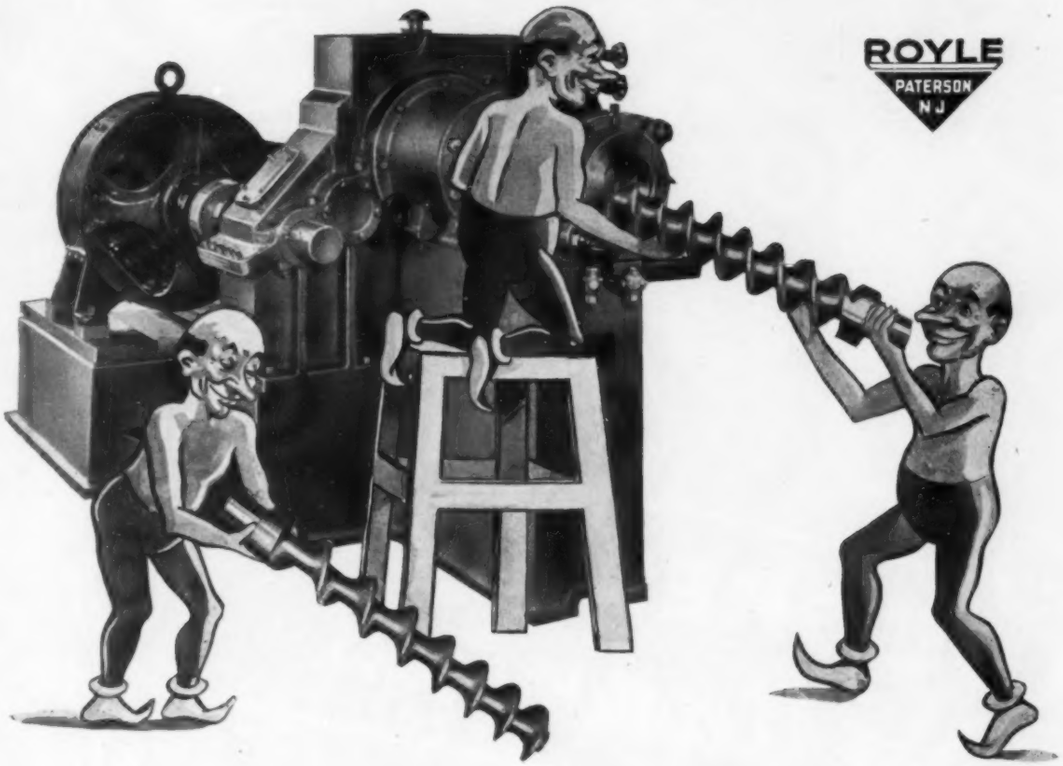

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VOLUME 53
NUMBER 2

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The **RUBBER AGE**

VOL. 53, No. 2 **MAY, 1943**

A Method of Testing the Elasticity of Synthetic Rubbers at Low Temperatures

By GEORGE D. KISH

Development Engineer, Dresser Mfg. Co., Bradford, Penna.

WITH the appearance of many new synthetic rubber compounds the need arose for quick and practical testing of these materials, to determine their comparative applicability for uses formerly filled by natural rubber compounds. One of the most important points to be determined in regard to these synthetic rubber compounds was their elastic behavior at low temperatures. In many applications such information was of an imperative nature when these synthetics were to be introduced into the design of a new product. To obtain this data, accurately, we devised an instrument which we called an "Elastensometer".

Dresser coupling gaskets, compounded with natural rubber, have made possible pressure tight joints in gas, water, and oil pipe-lines for as long as sixty years without replacement. This type of coupling utilizes wedge-section gaskets as illustrated in Fig. 1. The flexing of these rubber-section gaskets permit, in the coupling, a movement of the pipe caused by temperature changes, soil settlement, and other disturbances, yet maintain a perfect seal and connection. The investigation of various synthetic compounds for use as coupling gaskets during the present emergency, therefore, presented serious testing problems, in order to assure the maintenance of high quality and long life in service.

A compound which has the satisfactory physical characteristics required for gasket material must retain those qualities under extreme conditions of temperature, in order to be acceptable. It has been found, for example, that some synthetic compounds, while exhibiting satisfactory characteristics in other respects, will become brittle as glass at temperatures somewhat below the freezing point of water.

The vital nature of rubber in pipe-line installations of gas, water, oil and gasoline lines serving the war

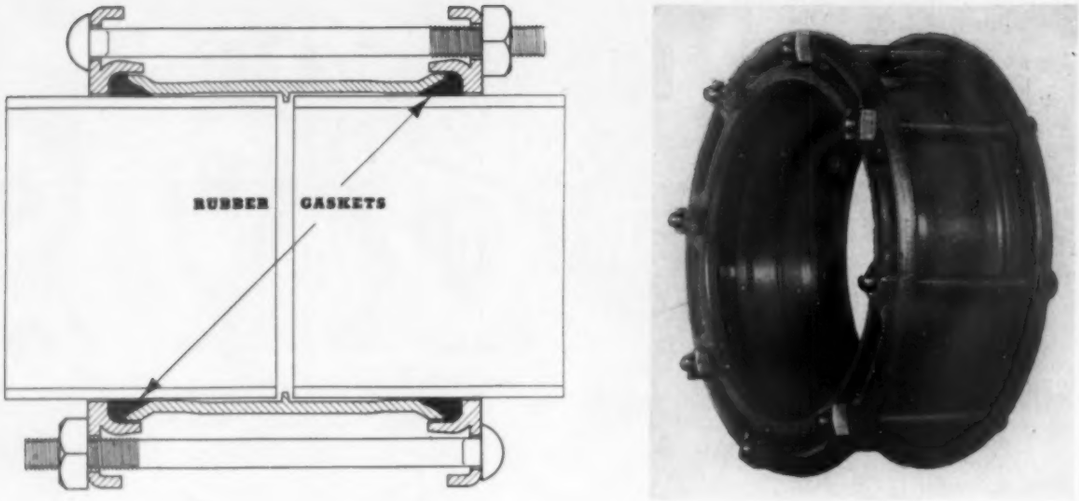


FIG. 1—Reproduced on the left is a cross-section of the coupling shown on the right. The rubber-wedge section gaskets permit, in the coupling, movements of the pipe caused by temperature changes, soil settlement, and other disturbances, and yet maintain a perfect seal and connection.

industry and the nation cannot be overestimated when it is realized that such installations are public utility services which must give continuous and permanent service. Failure of a pipe line at only one point may mean not only the loss of thousands of dollars but the slow-down, and possible shut-down, of numerous war production plants whose processes depend on gas, oil, or water. The most reliable method of joining pipe yet developed to assure permanent and dependable pipeline service is that which utilizes rubber as the bridging medium over the expansion-contraction-deflection gaps required in miles of steel tubing. This has been substantiated by several decades of experience. The dramatic role of a very small amount of rubber in an underground pipe line is not easy to visualize, yet the absence of that small piece of rubber frequently spells failure because steel, by itself, is not a reliable material for absorbing soil stresses, many of which are directly due to variations in temperature.

"For want of a nail the battle was lost"—, and, at even the risk of being trite, we may well say that for want of a small piece of rubber the service of a pipeline may be lost. Fortunately, the research effort of American rubber manufacturers has produced synthetic rubber compounds which will not only replace natural rubber but, in many cases, offer an improvement in product performance.

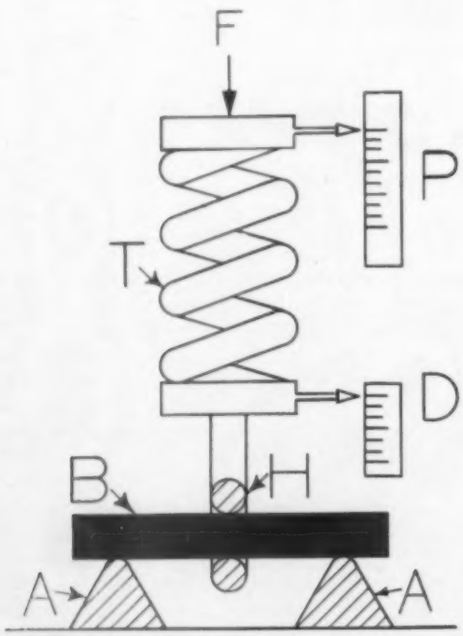


FIG. 2—Diagrammatic illustration of the operating principle of the Elastensometer.

Principle of the Elastensometer

However, the many new synthetic compounds have to be carefully tested to determine those best suited for the individual application. The Elastensometer, which permitted us to determine the "freeze resistance" of these synthetics, has been very successful in filling this need for such data. The principle of this instrument is illustrated diagrammatically in Fig. 2. Utilization is made of the fact that, for rubber-like materials in general, the modulus of elasticity varies inversely with the temperature, as the temperature is lowered. A sample of the material to be tested is supported in the form of a simple beam (B), .290" dia. x 1½" long, free supported over anvils (AA) and centrally loaded at (H). The force (F) required to produce a given constant deflection (D) is transmitted through spring (T) and indicated on scale (P). Knowing the value of (F) at intervals of temperature, as the temperature of the test bar is dropped, a force-temperature curve can be plotted. The critical limit of normal elastic properties is reached at such temperature where the force required to produce constant deflection increases rapidly.

Fig. 3 is a photograph of the Elastensometer as constructed. A dial indicator is direct-connected to the loading rod and shows the deflection in thousandths of an inch. Loading is applied with a hand-lever and is transmitted to the test bar through a double-wound spring. Calibration of the loading spring (Fig. 4) for values indicated on the vertical scale was made directly by unscrewing the anvil plate and mounting the instrument on a pipe fixture over the platform of a weighing scale. A suitably encased thermometer is mounted close-grouped with the deflection dial and force scale for easy reading of all three. The instrument weighs less than 5 pounds and was designed to be supported in the left hand while being operated with the right.

A lay-out of the complete equipment required for testing is illustrated in Fig. 5. This includes the Elastensometer, insulated cup, splash-pan, cracked dry-ice, alcohol, a hollow cutter for making .290" dia. x 1½" long test-specimens, spoon for handling the dry-ice, and tongs for inserting the test-specimen into the anvils. (EDITOR'S NOTE: This apparatus is not being commercialized at present. If there is a sufficient demand for it, it will be turned over to some manufacturer to produce and sell it at nominal cost).

Method of Conducting Test

To conduct a test, the sample is inserted into the anvil (Fig. 6) and through the looped end of the loading rod; since one inch of the 1½" length is unsupported, ¼" of support is obtained on each anvil and the test bar is prevented from slipping out by means of removable pins. Testing is begun with the base of the instrument immersed in a cup of alcohol at room temperature. The technique of the test is to apply a sufficient load with the hand lever to produce a given deflection; the indicated force and temperature are then noted and the load is allowed to return to zero. This process is repeated at suitable intervals as the temperature is carefully lowered by the addition of small quantities of dry-ice to the alcohol until the desired low temperature is obtained. Stirring is accomplished as required by raising and lowering the instrument thus allowing the coolant to flow through holes in the base plate.

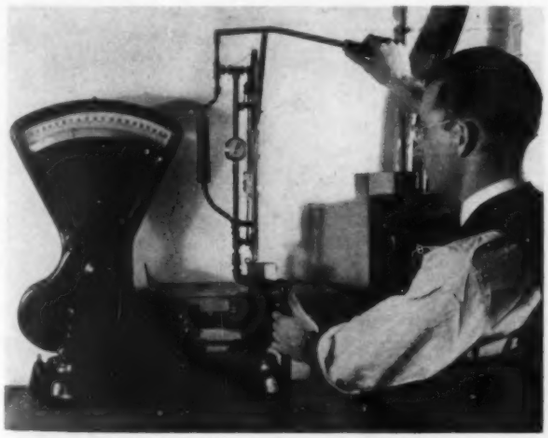


FIG. 4—Calibration of the loading spring.

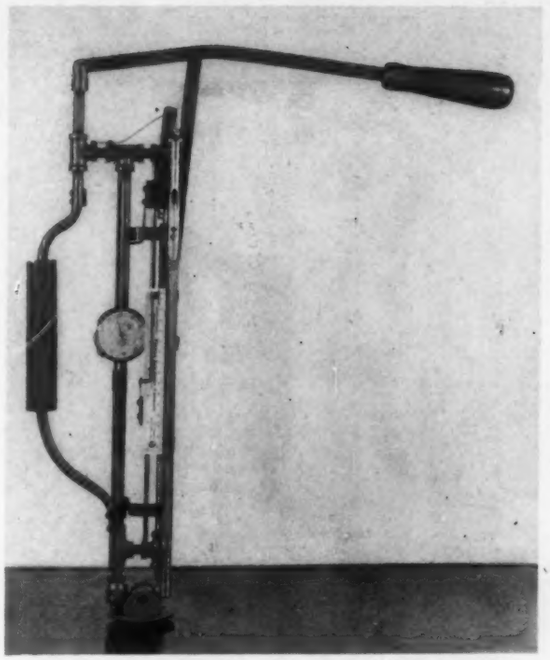


FIG. 3—Full view of the Elastensometer.

The Elastensometer was designed to provide economy of time and material and ease of operation. First consideration in this respect was to achieve simplicity in preparation of the test-specimen. This is accomplished by cutting the specimen with a hollow cutter operated in a drill press (Fig. 7). By this method, uniform, cylindrical pieces .290" dia. x 1½" long can be produced from any part of a plaque of the compound to be tested. The anvils (AA in Fig. 2) are placed to give free support at a distance of one inch apart;

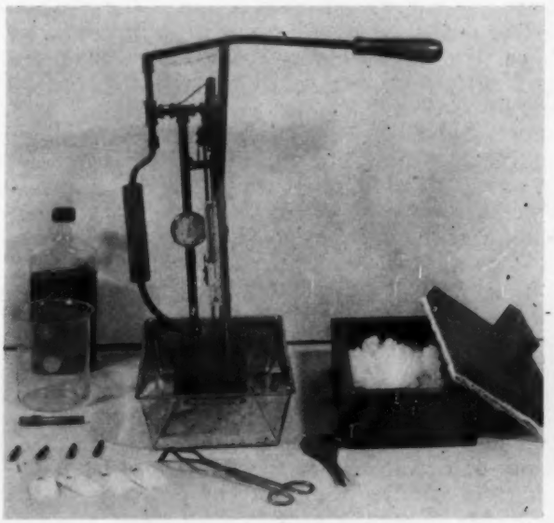


FIG. 5—Complete equipment required for making the low temperature test includes the Elastensometer, insulated cup, splash pan, box of cracked "dry ice," alcohol, beaker, hollow cutter, test specimens, forceps, and spoon.

FIG. 6—Method of inserting a test specimen into the supporting anvils of the Elastensometer.

this helps to simplify calculations. If desired, a numerical value for the modulus of elasticity in bending can be determined for any temperature since testing can be conducted even when the material is in a brittle state. (Tests at high temperatures can be conducted by use of a heated cup with or without an immersion fluid.) The operational base of the device, together with the test specimen, is compact enough to permit immersion in an insulated cup only 300 cc. capacity. Further advantage of the method lies in the fact that comparatively small testing forces are required, as opposed to tensile pulling, which makes for a light, easily handled and hand-operated instrument.

Figs. 8 and 9 represent test results of two different compounds of like characteristics at room temperature, but widely differing at low temperatures. In each case two curves are represented, showing effect of different values chosen for deflection (D). To provide quickly made comparative results the same deflection must, of course, be applied to all tests. Points X and X^1 on the curves indicate the critical limit as determined by inspection. The critical limit as referred to in this reference is defined as that temperature at which the modulus of elasticity begins to increase at a rapid rate. By plotting values of force required to produce a constant deflection against temperature, the first sudden change of curvature indicates the critical limit.

Factors affecting the choice of deflection (D) are:

1. The maximum value which will not cause a permanent set at the testing temperatures, remembering that the modulus of elasticity tends to increase as the temperature is lowered.

2. The minimum value which will show marked change of curvature at the critical values of temperature. If (D) is too small, significant points on the curve may escape visual detection.

In general, the maximum value of (D) which will not cause a permanent set, *i. e.*, exhibit negligible time-lag in achieving full recovery, is used. D = .050" has been found to be of ample range for practically all commercial synthetic rubbers produced thus far where the critical limit is of chief interest. For studies considerably below the critical limit a smaller value, as for example, D = .030", is used.

A descriptive scale of interpretation may be applied to the D = .050" curves as follows:

0 to 8 lbs.	Flexible
8 to 15 lbs.	Semi-Flexible
15 to 22 lbs.	Firm
22 to 30 lbs.	Hard
30 to 40 lbs.	Brittle

Descriptive scales of elastic behavior for other values of (D) below the critical limit are, in general, chiefly dependent on the nature of the application. Where the material is almost completely confined, as is the case with Dresser coupling gaskets, the "semi-flexible" state is in the safe zone. For such applications as automobile tires, for example, where there is no confinement and the material is directly exposed to wear, the critical limit would probably define the safe temperature limit, and might require closer definition.

The modulus of elasticity (E), in bending, at any temperature may be obtained by the use of the conventional beam deflection formula:

$$(1) \qquad E = \frac{P\,L^3}{48\,I\,D}$$

where P = load in pounds (applied gradually), L = length (= 1"), I = moment of inertia of cross section about the neutral axis (= .04909 d^4), and D = deflection in inches.

FIG. 7—Cutting a test specimen with a hollow cutter in a drill press.

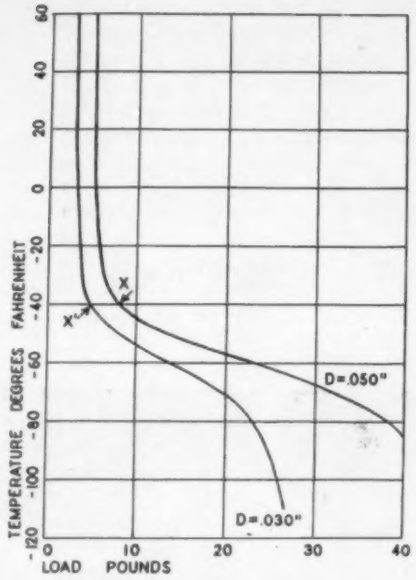


FIG. 8—Test results of a typical safe low temperature material.

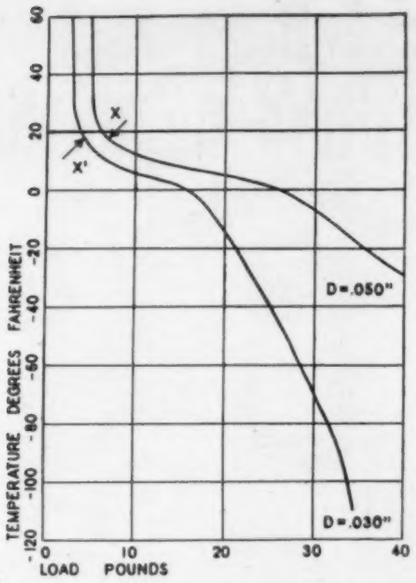


FIG. 9 — Test results of a material whose critical temperature is above 0° F.

Since the modulus of elasticity in bending (E) tends to increase as the temperature is lowered (Fig. 10), the limiting critical temperature as obtained with the Elastensometer may be closely defined as that temperature where the normal value for (E) increases to the maximum value permitted for the application. For materials exhibiting given elastic characteristics at normal temperatures, the tolerable deviation at the limiting temperature may be specified in percentage of increase in (E). For example, rewriting equation (1):

$$(2) \qquad E = K \frac{P}{D} \text{ where}$$

$$(3) \qquad K = \frac{L^3}{48\ I}$$

Using the values plotted in Fig. 8 for a test specimen whose diameter is .290″,

$$(4) \qquad K = \frac{1}{48 \times .04909 \times .290^4} = 60,$$

and a table of values may be constructed as follows:

TABLE OF VALUES

Temp., °F.	*E*	*% Increase of E*
60±20°	6,000	0
—20	7,200	20
—37	8,400	40
—40	9,600	60†
—45	12,000	100
—57	24,000	300
—68	36,000	500
—85	48,000	700

° Taken as normal. † Typical critical limit selected by visual inspection: Points X and X¹, Fig. 8.

While the critical limit may thus be specified mathematically, determination by visual inspection is usually adequate. Good results may be obtained with comparatively large tolerances on the diameter of the test-specimen.

Tests made with the Elastensometer have been found convenient and inexpensive to conduct, as no great outlay of equipment is required. A sample compound can usually be tested in thirty minutes, including the time required for cutting the test-specimen in a drill press.

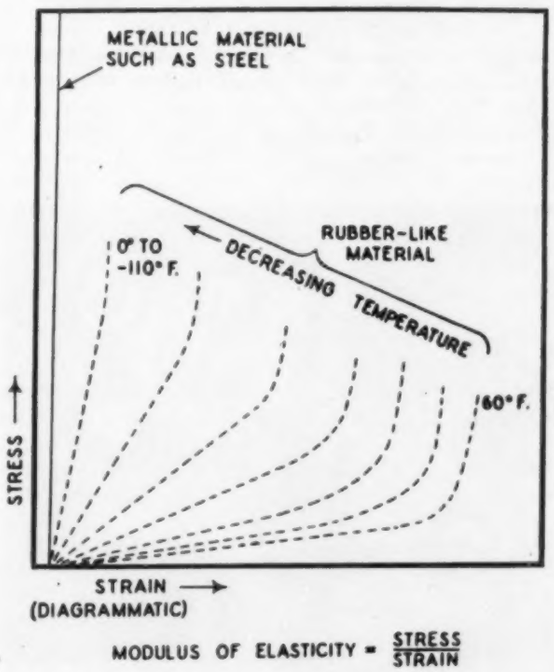


FIG. 10—Diagrammatic illustration of the changing values of the modulus of elasticity of rubber-like material with decreasing temperature.

Wool Felt as a Substitute for Rubber

By WORTH COLWELL

The search for satisfactory substitutes for rubber, occasioned by the drastic restrictions imposed by necessity on many rubber products, continues. In past issues considerable space has been devoted to newly-discovered rubber-like materials, such as Resistoflex, which are replacing rubber in many applications. However, there are many well-known materials, not especially rubber-like, which are also finding use as substitute materials. The progress made by one such material—wool felt—is depicted in this article.—Editor.

SHORTAGES of numerous materials have caused designers and manufacturers to look around for alternate substances, and one of these which is proving remarkably versatile is that very old substance —wool felt. Used by the ancients, it is said, long before they knew how to spin and weave fibers, it has come down through the ages not greatly changed, but much improved. In its modern form felt is most welcome to producers of a wide range of war materiel. Its great advantage these days is that it is fairly plentiful, for at this writing there is reported to be on hand more wool in the country than there was before the Pearl Harbor incident. Not only has the domestic yield been good, but huge quantities have been received from South America, Australia and a certain amount from Africa.

Many modern processes in essential industries require wool felt for functional uses. Its role in the operation of machinery is vital. Its remarkable versatility derives from an unparalleled combination of inherent physical properties which no other single product enjoys. Felt was drawn into the groove when Army, Navy and other departmental specifications were framed early in the period of national defense planning. Since we entered the war its uses have multiplied measurably with the expanding program.

Wool felt cushions (as seen above) have been substituted for sponge rubber pads in the bucket seats of the Lockheed navigator training plane.

The felt used as a pad on the floor platform of Lockheed's navigator training plane replaces the rubber mat which was formerly used.

War production has increased consumption to satisfy the needs of the armed forces to a surprising degree, and for both old uses and new. Plants filling contracts are using it in many hitherto unheard of ways. With restrictions on the use of rubber, cork, silk, leather, certain plastics and numerous other materials, civilian industries have been crying out for special felts to meet demands which engineers and production men in the busy felt mills have never even dreamed of until recently.

Aside from its own virtues, wool felt has the merit that it can be worked by simple methods. It requires no special forming dies, molds, presses, curing operations or supplementary finishing treatment. Selvages will not ravel or spread. Once cut, skived, turned or pressed, felt parts are ready for use. Another reason for its growing acceptance is that the felting process fortunately admits the inclusion of a great variety of other fibers in the mixes used in making felts of grades adaptable to varied purposes.

Like the clothing of the ordinary civilian, the uniform and equipment of the soldier contain many elements of felt, often as an alternate for sponge rubber or other types. Cushioned straps for steel helmets, interlinings in jackets and mackinaws, insoles for shoes, aviators' boots, winter caps, the Navy's storm helmets, arm bands, chevrons and other insignia, are among the numerous apparel items for which wool felt is specified. It is found as an air filter in gas masks; in canteen covers as a heat insulator. Fuselages of bombers and other war planes are lined with light weight kapok-wool felt for insulation of sound as well as heat. Felt enclosures help to equalize the operating temperatures of gyroscope and bomb-sight. Parachute landing and back pads are of this material, while the jungle pack saddle is a neat example of the felt cutter's art. Vibration damping pads are used between the airplane engine and the speed ring, as well as numerous other parts.

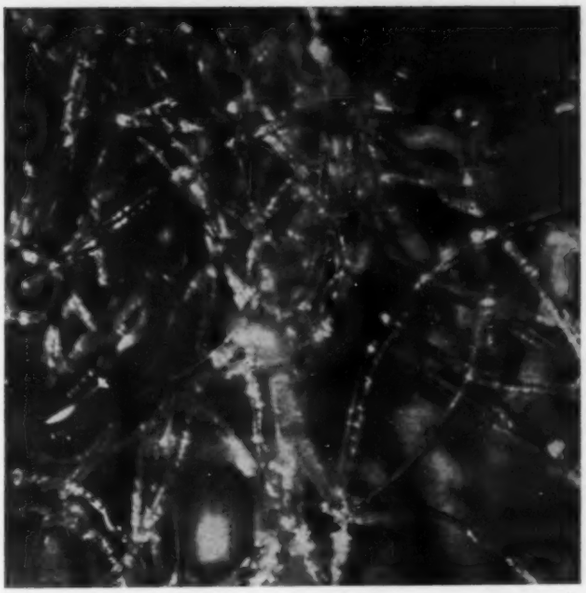
Tank soldiers' armor is padded like a football player's and the tank walls are felt-padded, too, in some cases taking the place of both soft and medium rubber. Many mechanical felt parts hold and feed oil to bearing points and more shield the bearings from dust, mud, water and foes of finely finished surfaces. Sometimes these are impregnated with rubber, synthetic rubber or plastics; often this is not necessary.

Our Alaskan, or cold weather felt boot, and the aviator's felt boot are important items of footwear. The Soviet Army, in turning back the German military machine, has given full credit to the old Russian boot made entirely of felt which has permitted its soldiers to move and to rest in equal comfort, while the Nazi soldiers froze in their tracks or in their sleep. Other armies, including our own, have successfully used felt-lined rubber boots.

The Navy face masks, hoods and helmets are made of it, an advantage being that it does not chafe the cheeks or cause undue perspiration. Chevrons and insignia have taken enormous yardage of this material. The Navy has countless uses for heavy grades for mechanical uses which appear to be increasing with the disappearance of parts formerly made of rubber.

When it comes to munitions, wool felt parts are used in shells and flares in the fuse timers, firing mechanisms and as charge timers. Shell cases are lined with it, and it is employed for lubricating the mechanism of the Thompson gun. Motor truck bodies specially designed to transport the more violent explosives are padded with it. The Signal Corps protects delicate radio tubes and other fine equipment with containers made of a soft fluffy grade, succeeding sponge rubber.

Wool felt (almost touching man's fingers) has replaced rubber pads on cover door of bomb fairing shackle.



The interlocking fibers in wool felt are shown in this photomicrograph, enlarged to 75 diameters. Oval spots indicate particles of entrapped oil.

As an element of design and construction in mill and factory, wool felt also appears, often alternating for rubber. For air conditioning systems it serves as a packing material, vibration dampener, sound absorber. It is employed to absorb vibration in the precision boring of gun barrels.

One of the more recent applications is in mounting machinery to absorb vibration or resist shock, and this use is highly favored in some of the war plants because it facilitates re-arrangement of machinery with changes of program. Machines which are cemented down by means of felt pads can be shifted around without ripping up the floors, as lag screws are often obviated. However, this does not mean that wool felt would be as efficient as rubber in *all* cases. Each type of use becomes an individual engineering problem. In airplane construction felt fits nicely—washers in carburetors and magnetos and as gaskets in motors, also as lining for fuselages to absorb vibration.

A widely known manufacturer of electrical switch boxes has just announced a new industrial multi-breaker for use on 230-volt A. C. systems, having a dust-resisting enclosure with felt gasket between box and cover. A leading manufacturer of electrical instruments recently ordered a large quantity of L-shaped felt channel, replacing sponge rubber in a certain type of installation for cathode ray tubes.

Another of the leading industrial concerns is using felt washers in place of rubber in refrigerators. The parts are small, but the quantity involved in the first order ran to astronomical proportions. Numerous manufacturers of radio receiving sets are using felt

instead of rubber in mounting chassis. Blower units are now being cushioned on felt bases, instead of rubber, by a southern California manufacturer of heating and ventilating equipment.

These instances are merely illustrative of the many ways in which wool felt is being used in these days when purchasing departments are so deeply enmeshed in priorities and rationing of various materials.

From the standpoint of expediency, the industry is excellently equipped to meet the needs of the war emergency. The majority of the manufacturers are members of the Felt Association, Inc. The product is turned out in a wide range of standard grades, whose properties are described by specifications defined by the Society of Automotive Engineers and subject to production control by test methods specified by the American Society for Testing Materials.

These materials in sheets and rolls are fabricated in quantities and widely distributed by the mills to the felt cutters, whose business combines distribution and warehousing with the manufacture of cut parts to customers' requirements. The mills, in most cases, also maintain their own distributing branches and cutting plants.

About 17,000,000 pounds of felt were sold in 1940 and in 1941 production jumped to 26,000,000 pounds. Approximately 70 percent of this went for war uses. In 1942 the output was more than 30,000,000 pounds and about 80 percent for war. With present mill equipment an annual capacity of 40,000,000 pounds is possible.

With mills in leading war equipment areas under guard and heavily committed on war orders, not much can be said of progress in the evolution of felts using non-strategic materials. But technologists are busy in closed laboratories and doing considerable research which, it is believed, will produce some very important results that will aid the job of winning the war.

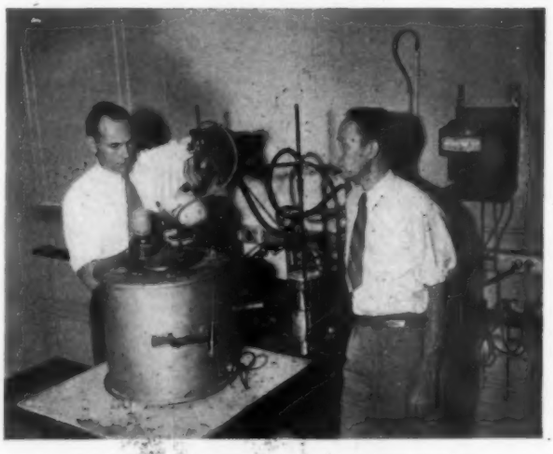
Paracon—A New Specialty Rubber

A NEW specialty rubber which may help to meet essential war needs has been developed by the Bell Telephone Laboratories, which maintains headquarters at 463 West Street in New York City, as a by-product of research in insulating materials. This new material, called Paracon, looks and feels like ordinary rubber, resembles it fairly closely in mechanical properties, and has important advantages for certain purposes. The following information on the new specialty rubber was furnished by the company:

Paracon has a high resistance to damage by oil or gasoline. It is also better than natural rubber in resistance to heat, light and oxidation although inferior to natural rubber in resistance to steam, alkalies and acids. It can be worked with ordinary rubber machinery. In its raw state it is highly plastic and unusually well adapted to molding into intricate shapes and to use in producing rubberized fabrics. Paracon might be used for making inner tubes but its special fitness for other applications and its present limited production rule that possibility out of immediate consideration.

Paracon can alleviate the rubber shortage in those lines of manufacture where its peculiar properties give it an advantage over natural rubber. In helping to meet the present difficulty Paracon is useful not only as a replacement for rubber but more particularly as a material for special applications where, as in the aircraft field, its combination of unique properties is required. An important advantage of the new material is that it will not compete with other synthetic rubbers for its basic raw materials since the chemical intermediates required for its production are derived by other trains of chemical processes.

For its synthesis it uses two major types of intermediate material. These can be derived from agricultural products and coal products; or from coal and petroleum sources; and in each case by a variety of different chemical processes. Although the equipment for manufacturing Paracon is highly specialized it differs from that required for synthetic rubber production; and, consequently, Paracon can add to the present supply of rubber substitutes without interfering with the production of those already under way.



C. S. Fuller (right) and B. S. Biggs, chemists of the Bell Telephone Labs., credited with the development of Paracon, the new rubber-like material, the result of two years of research.

The synthesis of Paracon was accomplished by Drs. C. S. Fuller and B. S. Biggs of Bell Telephone Laboratories and their associates. Some months ago, at a time when their experiments had demonstrated the practicability of Paracon, information as to it was made available to the Baruch Rubber Committee and to the War Production Board. To carry the development from the laboratory scale to that of quantity manufacture, the Laboratories turned over to some chemical manufacturing companies full information as to the processes involved. One of these companies, The Resinous Products and Chemical Company, Philadelphia, Penna., is now producing Paracon on a semi-commercial scale.

An Improved Procedure for Testing with the Pusey and Jones Plastometer

By ROSS E. MORRIS[1] and RICHARD E. HARMON[2]

THE Pusey and Jones Plastometer was designed originally for measuring the hardness of rubber-covered lower press rolls of paper machines. The plastometer has since been employed to measure the hardness of all types of rubber and is now required for hardness tests in many government specifications. A photograph of this instrument is shown in Figure 1.

The essential parts of the plastometer are a hemispherical point 0.125 inch in diameter, which acts as the indentor, a one kilogram weight arranged to press downward on the indentor, and a micrometer gage which measures the penetration of the indentor into the rubber. The procedure for determining the hardness of rubber as detailed in Government *(3)* and American Society for Testing Materials specifications *(4)* is as follows:

Present Procedure

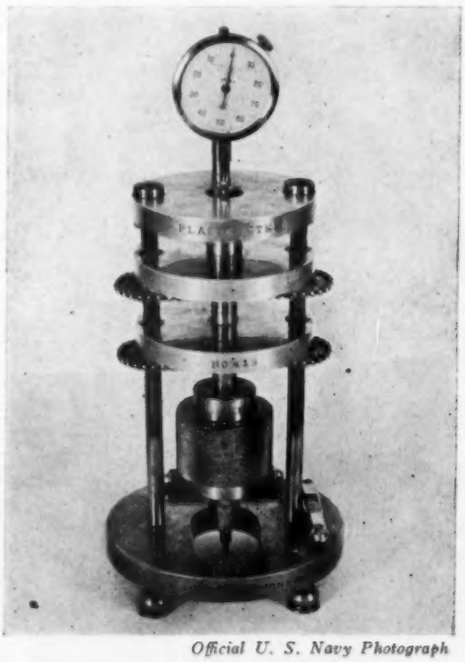
The indentor shaft is lowered until contact is made with the specimen and the gage needle makes three revolutions. The dial is then adjusted to read zero for the needle position. The weight is lowered onto the indentor carefully without shock, and the supporting plate is lowered still further so that the weight rests fully on the indentor as shown by a space of approximately 3/16 inch between the supporting plate and the shoulder of the weight tube. The amount of indentation is read on the gage exactly one minute after application of the load.

As a result of wide experience with the use of the plastometer the authors conclude that these instructions are lacking in one important particular, namely the method for neutralizing the friction inherent in this instrument. Figure 2 is a sketch of the essential parts of the plastometer showing the location of friction between the weight tube and the plates, and in the gage. Inasmuch as this instrument was designed to indicate a movement of less than 0.01 mm. in the indentor ball, even the slightest friction in the sliding parts or the gage would be expected to interfere with the accurate measurement of hardness.

In order to eliminate the effects of friction as much as possible, the authors set the plastometer on a vibrating platform as shown in Figure 3. The vibration is obtained from an electric buzzer bolted to the platform. Leveling screws are provided on the platform so that the weight tube may be maintained in a vertical position. The vibration prevents the weight tube from hanging up on the guide plates during the hardness determination.

A further change in procedure is advisable in order to neutralize all friction at the start of the test. When the indentor shaft is lowered until contact is made with the specimen and the gage needle makes three revolutions, the indentor actually presses further into the rubber than would be caused by the weight of the indentor shaft plus the spring tension in the gage. The excess pressure on the indentor shaft is caused by the sliding friction between the spindle and the stem of the gage. If the dial is now adjusted to read zero for the needle position, the final indentation reading will be less than it would be were the sliding friction not present.

Part but not all of the excess penetration may be recovered by tapping the vibrating platform with a fairly heavy piece of wood such as a screw driver



Official U. S. Navy Photograph

Fig. 1—Pusey & Jones Plastometer.

Note: The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

(1) Senior Rubber Technologist, Rubber Laboratory, Navy Yard, Mare Island, California.

(2) Associate Rubber Technologist, Rubber Laboratory, Navy Yard, Mare Island, California.

(3) Federal Specification for Rubber Goods; ZZ-R-601a; July 25, 1940.

(4) American Society for Testing Materials Standard Method, Designation: D531-41.

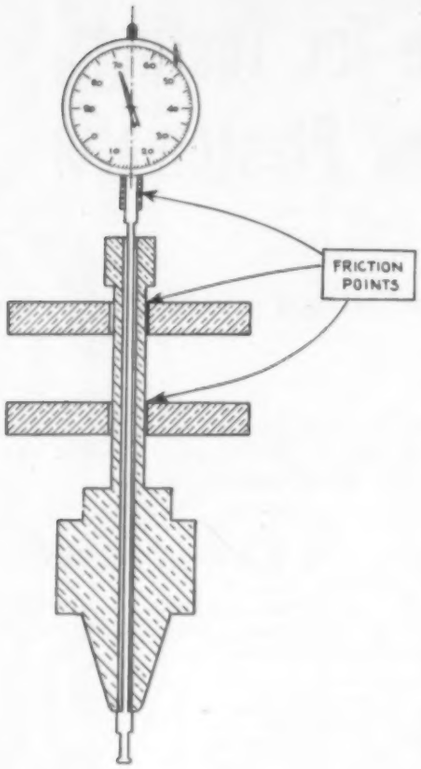


Fig. 2—Diagrammatic sketch of Pusey & Jones Plastometer showing points of friction.

handle. The set taken by the rubber prevents all of the excess penetration from being recovered.

The most satisfactory method for neutralizing the sliding friction between the spindle and the stem of the gage is to lower the indentor shaft onto the rubber by hand. The indentor shaft is first lowered by the regular mechanical method until contact is made with the specimen and the gage needle makes three revolutions. Then the indentor shaft is raised by grasping the upper point of the gage and the specimen moved so that the indentor will contact a spot at least 3/8 inch from the first spot.

After this adjustment the indentor shaft is lowered by hand without impact, and the platform vibrated with the buzzer until the gage needle no longer indicates a downward movement of the shaft. The dial is then adjusted to read zero for the needle position and the remainder of the determination carried out as detailed in the Government and A.S.T.M. specifications except that the instrument and specimen are resting on the vibrating platform.

Effect on Measurement

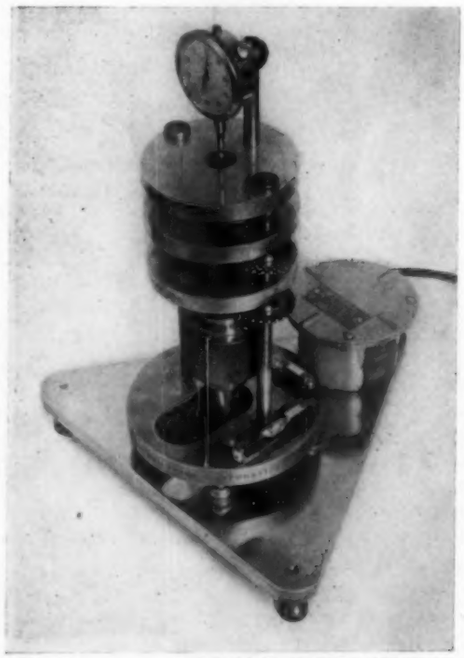
These precautions for neutralizing friction would be expected to result in higher indentation values. The data given in Table I show that this is the case. The indentation values given in the Table were taken on a soft and a comparatively hard vulcanizate prepared from natural rubber and each of several synthetic rubbers. Each value is the modal average of six determinations. The specimens tested were all 0.5-inch thick with parallel sides and 2 inches in diameter. In every case the difference in readings between the A.S.T.M. procedure and the proposed procedure is greater for the softer stocks.

Not shown in the Table is the decreased spread in test values obtained when the vibration method is used. This is another advantage of the proposed method.

If all the Pusey and Jones Plastometers used in various laboratories possessed the same internal friction, there would be no reason for changing the present testing procedure. Unfortunately, it cannot be assumed that such is the case, and, inasmuch as there is no method for establishing a correction factor, it is advisable to neutralize the friction in the plastometers in the manner described.

TABLE I.—COMPARISON OF MEASUREMENTS MADE BY THE A.S.T.M. PROCEDURE AND THE PROPOSED PROCEDURE

		Pusey and Jones Indentation Number	
Vulcanizate	*Type*	*A.S.T.M. Procedure*	*Proposed Procedure*
Hevea Rubber	Soft	203	216
Hevea Rubber	Hard	70	77
Butyl B	Soft	189	203
Butyl B	Medium Hard	124	131
Neoprene GN	Soft	168	184
Neoprene GN	Hard	46	49
Buna S	Medium Hard	120	131
Buna S	Hard	66	71
Stanco Perbunan	Soft	142	152
Stanco Perbunan	Medium Hard	108	116
Stanco Perbunan	Hard	73	79



Official U. S. Navy Photograph

Fig. 3—Pusey & Jones Plastometer mounted on a vibrating platform.

Carbon Tetrachloride —From the Health Viewpoint

By H. P. QUADLAND

Safety Research Institute, New York, N. Y.

The health hazard presented by the use of carbon tetrachloride in the rubber industry, as previously pointed out by Dr. J. Newton Shirley (Rubber Age, December 10, 1932), is a controversial subject. Because war-time conditions have resulted in the vastly increased use of carbon tetrachloride, in the rubber as well as other industries, we asked the Safety Research Institute to bring us up to date on the subject. The result is the accompanying article which is neither "alarmist" nor "apologist," but simply a presentation of the facts as brought to light by experimental work during the last few years.—Editor.

THE vastly increased use of carbon tetrachloride under war-time conditions has generated renewed interest and stimulated a desire for more complete information relative to its health aspects. Due to war-time restrictions, late production figures have not been issued, but in the period 1933 to 1940, the latest year for which figures are available, the output more than tripled, rising from 30,343,693 to 100,811,000 pounds.

Evaluating Health Aspects

In evaluating the health aspects of any organic solvent, two entirely different effects of exposure to its vapors must be distinguished. First, all volatile industrial organic solvents produce anesthesia, or unconsciousness, if their vapors are breathed in sufficient concentrations. Secondly, under circumstances favorable to the development of injury, whether it be the physical condition of the exposed person or the severity of the exposure to the toxic material, most solvents may exert secondary effects. That is, they may disturb the functioning of, or otherwise cause damage to, one or more of the bodily organs.

There is considerable confusion between these two effects. Many people jump to the conclusion that serious injury always follows acute exposure to solvent vapors. This, however, may not be true. There have been numerous cases where more or less acute exposure to solvent vapors, including carbon tetrachloride, has caused anesthesia without any untoward secondary effects.

On the other hand, exposure to unsafe concentrations of most organic solvent vapors may, under the proper circumstances, cause secondary injury without anesthesia. Such situations may occur where adequate mechanical safeguards are not set up and exposed persons do not report early symptoms.

Insofar as the anesthetic effects of carbon tetrachloride are concerned, a study of the literature gives a fairly comprehensive picture. In "Toxicology and Hygiene of Industrial Solvents," K. B. Lehmann reports the results of his experiments on humans, as follows:

Concentration of Carbon Tetrachloride (Parts per million)	*Exposure (Minutes)*	*Effects*
3,200	5	None
4,800	2½	Slight stupor
6,400	3	Oppression, heaviness, stupor
9,500	1½	Slight fainting
12,700	1	Unconsciousness, followed by complete recovery

Dr. Paul A. Davis, who conducted his experiments in Akron, the home of the rubber industry, reported no lasting ill effects from brief exposure to carbon-tetrachloride-vapor concentrations ranging from 158 p.p.m. to 2,382 p.p.m. In the higher exposures, nausea, sleepiness and slight vomiting occurred but, 48 hours after the exposures, examination of the subjects showed no ill effects.

To endanger life, according to Flury (*Arch. Exp. Path. W. Pharmacol.*, 1928), an exposure of 25,000 p.p.m., for a period of 30 minutes, or 50,000 p.p.m for five to ten minutes, is necessary.

Secondary Effects

As previously pointed out, secondary effects from rather severe exposures to carbon tetrachloride vapors may not occur. However, if the exposure is severe enough, there may be injury to liver or kidneys, or occasionally other parts of the body. Lehmann states that serious cases are comparatively rare and the illnesses caused by inhalation are usually mild. "As far as can be seen at present," he says, "the dangers from carbon tetrachloride when used as a solvent are not very great."

A study of the cases in the medical literature indicates that the circumstances under which secondary injury due to carbon tetrachloride has occurred, have been typified by prolonged exposure to relatively large quantities of the liquid, attended by improper or inadequate ventilation. An illuminating statement with respect to this subject was made by Dr. Davis in a

discussion with Dr. E. K. Hayhurst (*J.A.M.A.*, 1934):

"Dr. Hayhurst says that the reason he hasn't got so many reports (re: carbon tetrachloride) is that there aren't so many cases and that the small amount of carbon tetrachloride required to produce nausea brings the individual to the hospital to find out the cause. If a man employed in a department using carbon tetrachloride states that he cannot keep his breakfast down, an alert physician immediately knows that the man is absorbing too much carbon tetrachloride. If he is removed from the job he will be all right in twenty-four hours. On examining the blood calcium I have found that it decreased in every case. In cases of headache, nausea or vomiting, complete aeration for from twenty minutes to two or three hours will bring about improvement, and a disappearance of symptoms in four or five hours."

In "Occupational Diseases," published in 1942, Dr. R. T. Johnstone states (page 103) that, "today, acute or chronic reactions to carbon tetrachloride are actually rare. The majority of cases happen outside industry where ignorant use of the substance has occurred. Likewise, many of the cases referred to in medical literature took place before the present-day knowledge of the solvent induced proper ventilation as well as proper precautions."

In Middle Group of Solvents

When compared to other solvents with respect to its secondary effects, carbon tetrachloride occupies a middle position. In classifying the organic solvents with respect to their health hazards under ordinary conditions of use in industry, where workers may be exposed to relatively low concentrations for long periods, F. Flury ("Toxicology and Hygiene of Industrial Solvents," page 276) has the following to say:

"The only classification possible is a threefold one, namely the division into comparatively harmless solvents, solvents with considerable toxic effect, and finally, strongly toxic substances that are especially dangerous.

"The following substances are to be considered as comparatively non-toxic solvents that are not dangerous from a practical point of view, especially when the conditions under which they are used are taken into consideration: the majority of the difficultly volatile substances, e.g., from the glycol series; and, among the more easily volatile substances, the solvents of the benzine series, ethyl alcohol, ether, the intermediate acetate esters, and probably also acetone; and among the chlorinated hydrocarbons, dichlormethane, monochlorethlyene, tetrachlorethylene.

"To the middle group belong the great majority of the solvents, the amyl compounds, the majority of the chlorinated hydrocarbons, such as chloroform, trichlorethylene, the benzol homologues, the chlorobenzenes, the hydrogenated cyclic hydrocarbons.

"The third group consists of the substances distinguished by an especially high toxicity and also by practical hazard: the methyl compounds, such as methyl alcohol, methyl chloride, dimethyl sulfate, tetra- and pentachlorethane, benzol and carbon disulfide."

Davis stated that the method of using volatile substances must be "in perfect accord with the nature of the substance." This would mean, with respect to carbon tetrachloride, recognition of its anesthetic properties as well as the possibility of secondary effects. Consideration must be given to its fat and oil dissolving properties, its boiling point of 170.15° Fahrenheit, and especially the density of its vapors, which are 5.3 heavier than air, necessitating downdraft ventilation with the vapors exhausted at floor level.

Maximum Concentration

After an extended series of experiments to find the maximum allowable concentration of carbon tetrachloride vapors that can be tolerated in the workroom without danger, H. F. Smyth (*Jrl. Ind. Hyg. and Tox.*, May, 1936) came to the conclusion that a safe concentration for continuous exposure is 100 p.p.m., and that this amount is safe for exposure of normal persons throughout the day, and day after day, while 1,000 p.p.m. is safe up to half an hour, providing the day's average does not exceed 100 p.p.m. These figures are now generally accepted as industrial safety standards.

Individual Susceptibility

Susceptibility to all organic solvents is greater with some people than others. One of a group may be affected by the vapors while the rest are not affected. This is true for carbon tetrachloride as for other solvents. The susceptibility is sometimes due to a predisposing condition of the affected person, such as diabetes, gastric ulcers, glandular disturbances, inflammation of liver or kidneys, unusual obesity, etc., but sometimes persons who are otherwise normal may suffer headache, nausea, dizziness, and other minor symptoms when exposed to concentrations of carbon tetrachloride averaging not more than 100 p.p.m.

Reduction of the atmospheric concentration of the solvent vapor to a very low point will benefit unusually susceptible people, but a common practice is to detect them by pre-employment or periodical medical examinations and assign them to other work.

The Fire and Explosion Hazard

In considering the effects upon health of exposure to carbon tetrachloride and various other solvents, the inflammability of the solvent vapors cannot be disregarded. The inflammable nature of the alcohols, benzine, gasoline, acetone, benzol and numerous other solvents is generally known and added precautions must be taken to prevent fire and explosion, especially as a result of metallic sparks or static electricity. In this respect, carbon tetrachloride is completely safe, inasmuch as it has no flash or fire point, being nonflammable and non-combustible.

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Better Management for the Rubber Factory

VI—TAXES

By ARTHUR ROBERTS

UP TO now, the rubber manufacturer has considered his income tax only around filing time but because the current rates are the stiffest in history and destined to go higher, making tax a major expense, it is necessary to consider this impost throughout the year the same as other costs. When the rates were lower, tax expense did not influence operations to a great extent. The rubber manufacturer figured his net profit at the end of the year and then computed his tax about a month before filing time, sometimes a few days before March 15.

Today, the same practice may bring the sheriff because this tax touches every element of business operation—sales, credits, collections, costs, working capital, profit and loss statement analysis, budgeting, etc.—consequently, the rubber manufacturer who expects to survive the duration and be ready for the big profit possibilities that should materialize in the postwar period must analyze every phase of operation throughout the year in relation to the Federal levy on income.

Old Yardsticks Being Scrapped

Many rubber manufacturers do not realize that the high tax rate is scrapping old yardsticks, changing ratios that were once considered normal, and complicating managerial procedure. These revisions must be given careful thought; otherwise, the result may be disastrous. If the rubber manufacturer does not give more consideration to income tax expense, not just as a tax payment, but in regard to its effect on operations, he may find it difficult to do business at a profit even though all his operating elements are what normally would be considered satisfactory.

Formerly, the yardstick of managerial efficiency was reflected in the net profit and then the Federal tax was deducted. The net profit was the thing. If it showed a satisfactory return on investment and the ratio to sales was at least passable, the rubber manufacturer considered that he had done a good managerial job. He could figure on crediting a substantial part of the net profit to surplus or net worth because the tax of former years took only a modest portion. Now it cuts so deeply into earnings that he can no longer place as much reliance in the net profit as a yardstick of efficiency because, after the income tax is deducted, the net will be substantially reduced. "Taxable profit" would be a better term for the difference between sales and over-all costs. The net profit is really what is left after the Federal tax is deducted.

Sales volume may also be affected by tax. The rate increases with net taxable income so those rubber manufacturers who go just over the borderline to a higher tax level may show a lower spendable profit than those whose volume is near the top of a lower bracket. Obviously, this will distort the basic principle of business, bigger earnings with bigger volume. The way the tax is levied today, you may earn less by increasing volume, even though you sell at profitable prices. This may put a damper on sales aggressiveness in the postwar period and kill the basic force that keeps free enterprise alive.

Estimate Taxes in Advance

When budgeting operations for a forthcoming year, it will be necessary to estimate the tax in order to prejudge how profitable sales volume will be. In the past, rubber manufacturers have entered the tax when paid, quarterly or annually, as a charge against surplus or net worth, because the Federal tax cannot be deducted from the income on the tax return. From the income tax standpoint, this was satisfactory but from the standpoint of business analysis, it was something different because it beclouded perspective. Some sort of a Ruml plan is likely to become law and this will compel the taxpayer to enter his tax weekly or monthly; but even if this proposed legislation does not pass, the rubber manufacturer should pro-rate his tax monthly to determine his spendable income for that period. Every rubber manufacturer should have a profit and loss statement prepared monthly and if the income tax is not pro-rated, instead of entered quarterly or annually, he will not get the proper perspective on operations, month-to-month, because the net will be inflated.

Accounting phraseology or theoretical argument notwithstanding, the business man is concerned, in the final analysis, with the spendable profit because that is what he can bank after the income tax is paid; hence,

he should figure on that objective, no other. If this figure is unsatisfactory, he must work back from there and analyze operations to determine the reason. He may have to revise his costs, cut corners on overhead, install more modern machinery (if he can get it) or rearrange existing equipment to speed up production so that he can increase taxable profit and have enough pocket-profit left after the deduction of income tax to sugar the surplus on the right side. Procedure will depend on circumstances and they differ with the plant; hence, we do not attempt here to offer concrete advice or specific suggestions. Our purpose is mainly to impress upon the rubber manufacturer the necessity for revising his viewpoint and method of handling tax expense, giving the reasons why revision is necessary.

The foregoing is not one man's opinion. Credit men and commercial authorities are already giving consideration to the changing yardsticks brought about by high taxes and are revising their methods of business analysis. In the future, when granting credit, the credit man will consider the tax that will have to be paid on business operations, not only around March 15, but throughout the year, pro-rating the expense per month, a factor that did not inject itself into credit analysis heretofore. Inasmuch as business specialists are already considering the changes that high taxes will superimpose on operating ratios and routine, the rubber manufacturer should also get in line now because the trend will gain momentum fast and he will benefit by early compliance with the change. When investigating prospective credit customers, consider their tax liability in the same way your bank or supplier will consider your obligation to Uncle Sam when you apply for credit and it may be advisable to re-check the credits of old customers to determine what the tax now may do to earnings or financial standing.

The important carry-over, carry-back loss provisions now in the Internal Revenue Code demand consideration throughout the year in connection with operations. For example, if you had a loss carry-over of $24,000 in 1941, of which only $6,000 was absorbed in 1942, leaving $18,000 to carry over to 1943, then it is up to you in 1943 to see that net profit is at least $18,000. Whether you make it or not, you should work toward that objective. If it runs less, the unabsorbed portion cannot be carried over to a third year and you lose credit for the difference. This shows clearly that you can't forget your income tax throughout the year, that it is now so closely entwined with operations that you must consider it as an element of operating routine.

Advertising Cost Greatly Reduced

Certain outlays, such as advertising, must be viewed in the light of the tax deduction. For example, if the rubber manufacturer's net taxable income under the 1942 rates is $15,000, the net cost of $500 worth of advertising would be approximately $350. If he didn't spend the $500 for advertising, he would have to pay the differential in tax. This also applies to the manufacturer selling machinery or supplies to the rubber industry. Under the high tax rates, the cost of advertising is greatly reduced. Other expenses may be regarded in a similar light. Figure the net cost of outlay after deducting the tax to appraise value received. An odd way to figure, you say. Well, you will have to revise a lot of your figures and opinions to ride the duration and postwar period successfully.

The computation of selling prices may undergo change in the future. The usual procedure has been to consider costs first and build the selling price from there. Henry Ford has always reversed this formula. His success indicates that there may be something good in the idea, even for rubber manufacturers. At any rate, it is food for thought. As Ford explains it: "My policy is to reduce the price, extend the operations, and improve the article. You will notice that reduction of price comes first. I have never considered any costs as fixed. Therefore I reduce the price first to the point where I believe more sales will result. I do not bother about the costs. The new price forces the costs down."

Ford Formula May Be Criterion

High taxes, economic changes and governmental regulations may compel all businesses to follow the Ford formula in the days to come. Business men with traditional leanings will find the "bugs" in this system, but they are thinking in terms of existing practices and set-ups, which must be revised or entirely remodeled after the war to keep income and employment at peak. To pay for the war we must "up" income, at least to $200 billions yearly in the postwar period and, in prewar years, income never exceeded $80 billions annually, according to reliable statisticians. If this volume can be obtained by changing the costing formula and method of pricing, obviously the tax rate can be reduced for each business man because, given a fixed budget, the pro-rata tax will be halved if the income is doubled. So, the revised method of costing may cut your margin because it brings down prices but it will also cut your tax and probably provide a bigger gain.

The income tax laws are so full of gremlins that discussion never clarifies. Amendments have followed amendments willy-nilly, court decisions have twisted the original intent of legislators, the Tax Board of Appeals has handed down thousands of rulings interpreted in many different ways even on similar cases, rules and regulations have been piled on top of each other so that the ensemble is a hodge-podge of cloudy inconsistency, saying nothing about indirect taxes and other direct levies, Federal and State. No one knows what the effect of tax legislation will be. The Washington officials lay the levy and often the pressure goes where never intended. For example, some concerns add their taxes to costs and then figure gross profit on the costs. In effect, this means that the consumer pays his own tax and the tax of the concern whose product he buys plus a profit on the tax.

If taxes are added to the cost of a war product, the government as a customer would buy back its own tax plus the profit added by the seller, then the government must increase taxes to keep the merry-go-round from breaking down. The government may prevent some of this mumbo-jumbo by scrutinizing costs on war jobs but other elements of cost that work into tax will have the same effect. For example, the government permits depreciation at an accelerated rate on properties and machinery used in war work. Sometimes it lends money to build the plants. Depreciation is a legitimate part of cost, the government buys the output and helps pay for the property and equipment plus a profit, then permits a deduction for the depreciation on the income tax return. Obviously, this method of costing builds prices, inducing inflation, the very thing that high taxation is supposed to prevent with the aid of forced savings.

Excise taxes added to cost and then the profit computed also has an inflationary effect. Price control will minimize inflationary trends temporarily, but such pressure with other inflationary factors will blow the lid off the top eventually. The government is becoming increasingly alarmed about inflation and it is not unreasonable to assume that high taxes hidden in costs may be contributing to the trend.

In peacetime, such hidden taxes in costs probably helped produce unemployment cycles because they boosted prices beyond the level of purchasers, factories shut down for lack of sales, and relief rolls expanded. "The power to tax is the power to destroy," works in mysterious ways. The rubber manufacturer, with a little thought, can think of other bizarre colorings in the tax picture. This is probably the reason why there is always so much argument anent tax but, like Mark Twain's weather, nobody does anything about it. Tax has grown wild in our economic field, creating business erosion, destroying instead of cultivating income because it is unscientifically administered — and the Frankenstein is getting beyond control.

Rubber manufacturers, as a class, have never bothered much about the soundness of our income tax laws. Up to now, they were interested only in the tax they had to pay, but from now on the wise taxpayer will acquaint himself, not only with the tax in dollars and cents, but consider it as it affects his internal operations and external economic conditions, the latter indirectly vital to his well being. Many contend that the taxation system should be revamped, the Federal government to preempt the income and corporate tax fields, with a percentage of restitution to the States; likewise, the excise tax field. Preferably, one flat rate, including income tax, social security, Victory tax, unemployment insurance and probably other Federal levies instead of the cumbersome payments and computations now in effect.

Of course this is war and we must pay for it but the rates are now so high, the computations so complex, inequalities so unfair, interpretations so vague in many cases, borderline situations increasing whereby a transaction may be interpreted in more ways than one, that the present tax laws defeat their purpose, leaving business men bewildered and initiative crippled so that the ability to pay may be considerably lessened and free enterprise destroyed.

As we said at the beginning, tax is now a major expense and must be kept in mind throughout the year. You must study it and analyze your operations in relation to the tax rates and regulations, otherwise you may find yourself in a bad way regardless of how efficiently you supervise production and sales. It is also advisable to contact your Washington representatives, make them understand that you are taking a more critical interest in the subject so that they will remodel the tax laws to eliminate the "bugs" that irritate business operations and eat away profits.

Five Rules for Compounding GR-I (Butyl Rubber)

THE rubber industry is about to receive its first deliveries of GR-I (butyl rubber) from the new government plant at Baton Rouge, La. For this reason, the Office of the Rubber Director believes it is important to emphasize once more certain rules for compounding GR-I which *must* be observed if satisfactory results are to be obtained.

GR-I is different than natural rubber. Compounders will have to forget certain processing "tricks" which they have practiced for years to overcome various factory troubles with natural rubber stocks. The rules which must be followed in compounding butyl are simple. They concern softeners more than anything else; in regard to pigmentation the compounder has almost as much leeway as he has in compounding natural rubber.

1. Unsaturated softeners must *not* be used. Do *not* use pine tar, rosin, rosin oil, cumar, cottonseed oil, brown factice, natural rubber or reclaimed rubber. Instead, use paraffinic hydrocarbons, such as petrolatum, paraffin, medium process oil and white oil. Or, if resilience is also desired, paraffinic hydrocarbons such as Bayol D. Or chemical plasticizers of the types of aromatic ethers, halogenated aromatic ethers, halogenated aromatics and aliphatic substituted aromatics, such as P-cymene, dibenzyl ether, trichlordiphenyl ether, chlorodiethyl benzene, chlorinated diphenyls and dicyclohexyl adipate.

2. Unsaturated fatty acids must *not* be used. Do *not* use palm oil, oleic acid and cottonseed fatty acid. Instead, use fully saturated acids, such as stearic acid (although some synthetic stearic acids are not suitable).

3. Do *not* try to improve processing properties such as rate of extrusion, calenderability, or building tack by additions of small amounts of natural rubber or reclaim. As little as 1% or 2% of natural rubber in a butyl compound will cause a very poor cure. Before mixing a butyl compound on a mill or in a Banbury which has been used for natural rubber stocks be sure that the equipment is clean. Have the mill man clean out behind the guides; inspect the Banbury slide. A few pounds of natural rubber stock clinging to the back of the mill guides could ruin completely a subsequent butyl batch.

4. Do *not* expect to obtain satisfactory cures with the amounts of accelerator normally used in natural rubber. The thiurams are the best of the conventional accelerators to use in butyl and should be used to the extent of 1% on the rubber. For information about faster non-sulfur types of cures, get in touch with the Office of the Rubber Director.

5. Remember that butyl is much more impermeable to gases than natural rubber is. In building operations, if it is necessary to freshen surfaces, use solvent very sparingly and allow plenty of time to dry. Butyl has more natural building tack than any other synthetic and in most cases you will not need additional tack. Therefore, do not use *any* solvent if it can be avoided.

Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber

By FREDERICK MARCHIONNA, M. S. Chem.

Part X

Juve et al—U. S. Pat. 2,271,124—January 27, 1942. *Printing on Rubber.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Rubber articles which are to be printed with colored inks usually deteriorate quickly due to the action of the ink on the rubber. To avoid or retard this deterioration, the rubber surface to be printed may be covered with or made from a mixture containing 20 to 30 parts of natural rubber and 80 to 70 parts of a copolymer consisting of 75% polybutadiene and 25% polyacrylonitrile. If the copolymer is obtained from a mixture of 55% butadiene and 45% acrylonitrile, a higher proportion of natural rubber can be used. By varying the proportion of natural rubber and the copolymer, as well as the butadiene-acrylonitrile ratio, products having a wide range of physical properties can be obtained. The following compositions are given:

I—Perbunan, from 75% butadiene and 25% acrylonitrile (75), crude rubber (25), sulfur (2), accelerator (2), soft carbon black (5), zinc oxide (5), and butyl acetyl ricinoleate, dibenzyl ether, dibutyl phthalate, or similar softener (38), can be rolled and vulcanized to produce engraving plates.

II—Perbunan, as above (80), crude rubber (20), sulfur (3), accelerator (2), carbon black (25), cumar resin (40), and tricresyl phosphate (60), can be vulcanized about a metal roll to form a printing roll surface.

III—Perbunan, as above (80), crude rubber (20), sulfur (2), accelerator (1.5), carbon black (40), zinc oxide (5), lauric acid (1.5), and softener (40), can be dissolved in a solvent or dispersed in water and used for coating printing blankets.

IV—The printing blanket surfacing layer may be made from a composition containing a copolymer from 55% butadiene and 45% acrylonitrile (53), crude rubber (47), carbon black (40), lauric acid (5), sulfur (2), accelerator (1.5), and softener (40).

Juve—U. S. Pat. 2,271,125—January 27, 1942. *Printing Blanket.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

The Perbunan-natural rubber compositions described in U.S. Patent 2,271,124 can be used for making offset printing blankets, as follows: A number of pre-shrunk fabric layers are joined together by means of a vulcanizable latex or rubber cement, and a ground layer about 0.015 inch thick is then applied from a vulcanizable rubber mixture which is either calendered or filmed thereon. Several layers of the natural-synthetic mixtures described in the previous patent are then applied over the ground layer, beginning with a low set composition containing one-third of the copolymer and two-thirds low set rubber, increasing successively the quantity of the copolymer while reducing the quality of low set rubber. The printing surface coating is preferably made from a composition comprising natural rubber (30), Perbunan (70), sulfur (2), accelerator (1.5), carbon black (50), zinc oxide (5), lauric acid (1.5), and any of the softeners described in the previous patent (30). Instead of using intermediate coatings containing natural and synthetic rubber, the surface of the ground rubber coating may be treated lightly with chlorine and the surface coating material described then adhered thereto and vulcanized.

Dickson and Stafford—U. S. Pat. 2,272,036—February 3, 1942. *Golf Ball Cover.* (Assigned to A. G. Spalding & Bros., Inc., Chicopee Falls, Mass.).

A golf ball cover is made from a mixture comprising a rubber derivative (Thermoprene, as described in U.S. Patent 1,605,180) or a rubber hydrochloride (Marbon, as described in U. S. Patent 2,046,986), together with a rubber toughener, such as the bunas, neoprene, polyisobutylene and Thiokol. In one example, the composition comprises Thermoprene or Marbon (100), Vistanex (15 to 100), and neoprene (15 to 100). In another, Thermoprene (100) and natural rubber or/and neoprene (50 to 200). In still another, Marbon (100) is admixed with buna or neoprene or Thiokol, etc. (30 to 120) and about 100 parts of glue. Golf balls made with a cover of the above mixtures are said to be resistant to cutting and to cracking.

Swan—U. S. Pat. 2,272,254—February 10, 1942. *Printing Plates.* (Assigned to Bakelite Corp., New York, N. Y.).

A flexible printing plate is made from a base of woven fabric or wire fabric which is treated with a fixative, such as heat-hardenable phenol-aldehyde varnish, so as to coat the threads or wires with a varnish without filling the interstices of the fabric. The fixative coating, however, may be from a glue, starch or water-glass solution. A natural rubber or polyisoprene rubber composition is then calendered onto the fabric to form a layer about 1/16-inch thick and cured for 10 to 15 minutes. The coated fabric thus produced is placed upon a matrix, with the uncoated face in contact with the matrix, and the assembly placed in a platen press and subjected to heat and pressure at 135° C. and 1,000 lbs./sq./in., forcing the rubber layer through the meshes of the fabric and thus forming the printing plate.

Traylor—U. S. Pat. 2,273,425—February 17, 1942. *Chewing Gum Base.* (Assigned to Hercules Powder Co., Wilmington, Del.).

A chewing gum base comprises from 10 to 5% of ethyl cellulose, 40 to 60% of a rubbery material (natural rubber, polychloroprene, polybutadiene, etc.), and 5 to 50% of a resin, such as rosin, ester gum, polyvinyl resin, etc. A wax may be admixed with the above, together with a plasticizer, such as dibutyl or diamyl phthalate, amyl or butyl stearate, etc. In one example, the base comprises ethyl cellulose (117.2), rubbery material (117.2), hydrogenated cotton seed oil (116.8), and coconut oil (48.8). In another, ethyl cellulose (24), rubbery material (24), dibutyl phthalate (12), and clay (50). Formulas are given to produce the chewing gum itself. Any of the above compositions (100) is worked with pure sucrose (111), corn syrup (24), and oil of peppermint (2).

Desamari et al—U. S. Pat. 2,273,436 — February 17, 1942. *Chlorinated Rubber Paints.* (Assigned to I. G. Farbenindustrie, A.G., Germany).

Formaldehyde acetal products, and preferably the formaldehyde acetal of phenoxy ethyl, cresoxy, ethyl or hydroxy ethyl-para tolylsulfide, are incorporated in chlorinated rubber, after chlorinated polychloroprene, polybromoprene, etc. In one example, an iron plate is cleaned and coated with a primer coating containing any of the above chlorinated rubbery material (100), formaldehyde acetal of cresoxy ethyl (3), chlorinated diphenyl of 57% chlorine (1.8), and red lead oxide (60) dissolved in 1:1 toluene-xylene solvent mixture (23). After drying, a finish surface coating is applied, this coating containing chlorinated rubber or chlorinated polychloroprene (25), one of the above acetal resins (8), and titanium oxide (15) dissolved in 1:2 toluene-xylene solvent (52). Other formulas are given, while the preparation of the specific formaldehyde acetal resins is outlined in several examples.

Backle—U. S. Pat. 2,273,506—February 17, 1942. *Reclaiming Method.* (Assigned to General Aniline & Film Corp., New York, N. Y.).

Natural or synthetic butadiene rubber is reclaimed by heating in the presence of a solvent and a small amount of a peptizer, from the class of mono-aryl hydrazines, at 100 to 140° C. from 10 to 24 hours. The hydrazine may be phenyl hydrazine, nitro phenyl hydrazine, amino phenyl hydrazine, etc., and their salts with oleic acid, etc. In one example, synthetic rubber scrap from a copolymer of 75% butadiene and 25% styrene (Buna S) is heated with 50% of xylene and 0.4% of phenyl hydrazine, with agitation, at 120° C. for about 10 hours. In another example, synthetic rubber scrap from a copolymer of 75% butadiene and 25% acrylic nitrile (Buna N) is heated for 20 hours or more in the presence of an aryl hydrazine and a solvent as above.

Dittmar—U. S. Pat. 2,273,780—February 17, 1942. *Wax-Acrylate Blends.* (Assigned to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).

A waxy acrylate ester blend is obtained by heating 100 parts of a mixture consisting of 25 parts of a saturated hydroxy fatty acid ester, containing at least 12 carbon atoms, with 20 parts of a polymeric compound, from the group consisting of the acrylic and methacrylic acid ester of aliphatic alcohols, containing more than 2 carbon atoms, such as butyl methacrylate, and a wax in varying quantity. The fatty acid ester is preferably hydrogenated castor oil. The patent gives 22 tabulated formulas in which the proportions of the essential ingredients are varied and in some of which there are added ester gum or rosin. Interpolymers of the acrylic or methacrylic acid esters with styrene, neoprene, etc., may be used. Natural rubber, synthetic rubber, natural and synthetic chlorinated rubber, natural or synthetic resin, and plasticizers may also be incorporated in the waxy mass.

Mitchell—U. S. Pat. 2,273,880—February 24, 1942. *Wrapping Sheets.* (Assigned to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).

In the production of moisture-proof sheets having a base of cellulose derivative it has been found that when the base is coated with an intermediate coating of a polybutadiene having the drying characteristics of drying oils (as described in U. S. Patent 2,264,811) a moisture-proof sheet of excellent quality is obtained. Thus, a sheet of cellophane, cellulose nitrate or acetate, ethyl or benzyl cellulose, glycol cellulose, etc., is coated with the polybutadiene oily product in a solvent therefor, and heated to about 100° C. until the coating is cured into a relatively tacky condition. In several examples, a web of regenerated cellulose is coated with the polybutadiene oily product dissolved in toluene and containing small quantities of a drier, such as cobalt linoleate, using a 5 to 10% polymer, and dried, the tacky coating then being coated with a moisture-proof nitrocellulose lacquer containing wax, ester gum, and a plasticizer. In one of these examples there is used three parts of polybutadiene with two parts of styrene, or four parts of polybutadiene with one of wax. The nitrocellulose coating may be replaced with an ethyl cellulose (55) containing ester gum (25), wax (5), dicyclo phthalate (15) in toluene (580) and ethyl alcohol (150). The moisture-proof coating may also consist of butyl polymethacrylate (95) and wax (5) in toluene (730). In one specific example, the intermediate coating comprises polybutadiene oil (30), nitrocelllulose or ethyl cellulose (30), wax (3), ester gum (7), dicyclohexyl phthalate (20), dibutyl phthalate (10), manganese naphthenate (0.08) in toluene (245), ethyl acetate (450), and ethyl alcohol (35). In other examples the butadiene polymer is mixed with Pliolite and coated with Pliolite or a chlorinated rubber moisture-proof layer. The patent also claims the use of a polybutadiene obtained by heating a mixture of butadiene (3600), benzene (786), and butyraldehyde (128) with a catalyst consisting of equal parts of copper acetate, copper, iron, and iron oxides for five hours at 160° C., cooling, diluting with benzene (6650), filtering through active carbon, and evaporating the solvent.

Ott—U. S. Pat. 2,273,983—February 24, 1942. *Polychloroprene Products.* (Assigned to Hercules Powder Co., Wilmington, Del.).

A resilient composition resistant to gasoline and mineral oils comprises a vulcanized mass containing polychloroprene, a gasoline soluble chlorinated paraffine wax of 10 to 53% chlorine, magnesium oxide, and no more than 3% sulfur. The chlorinated paraffine wax functions as a softener for the polychloroprene. A polychloroprene which has been treated with hydrogen sulfide or ammonium sulfide may be used. In one example, a polychloroprene, as described in U.S. Patent 1,967,863 (150), chlorinated paraffine wax of 50% chlorine which has been stabilized with an alkali solution, as described in U. S. Patent 2,119,149 (75), sulfur (1.25), magnesium oxide (15), antioxidant (1.25), cumar resin (2.5), whiting (10), carbon black (150), zinc oxide (15), rosin (10), and pine tar (10), is cured at 288° F. for about one hour. When the cured material is immersed in gasoline at 60° to 70° F. for 672 hours, it shows a volume increase or swelling of only 3.6%, while the same composition without the chlorinated paraffine wax showed a swelling of 31.9% under the same conditions. In another example, a compounded polychloroprene as above, but containing 60 parts of a chlorinated paraffine wax of 34.2% chlorine (or of 48% chlorine in still another example), when cured and immersed in gasoline as above showed that the composition containing the chlorinated wax of lower chlorine content swelled less than that of the higher chlorine content.

Remy—U. S. Pat. 2,274,305—February 24, 1942. *Lubricating Material.*

A lubricating material having enhanced oiliness—which is defined as that property of any liquid to form a powerful anti-friction layer between two solids—is obtained by incorporating the chlorinated product of isoprene or polyisoprene, or mixtures thereof, in a petroleum lubricating oil. A mixture of trichloroisoprene or tetrachloroisoprene having a total chlorine content of 63.8% may be used. About 1 to 5% of this mixture, added to a paraffine motor oil, is sufficient to impart to the lubricant the desired oiliness. The chlorinated isoprene or chlorinated polyisoprene will not break down until a temperature of 900° F. is reached. Although the patent claims the use of a halogenated isoprene polymer, it does not disclose any particular type of polyisoprene.

Thomas et al—U. S. Pat. 2,275,164—March 3, 1942. *Porous Thermoplastic Products.* (Assigned to the Standard Oil Development Co., New York, N. Y.).

Halogenated rubber-like products from natural or polybutadiene rubber, polyisobutylene, polyethylene, etc., when used in the form of a powder which has been wetted with a solvent, at a temperature higher than the boiling point of the solvent while maintaining a pressure sufficiently low to cause the solvent to boil at a temperature below that which would cause the powder to coalesce, result in porous products in the form of separate particles. The amount of solvent should be 1 to 10% and preferably 5% of the weight of the chlorinated powder. The two specific examples given show the use of polyisobutylene or polyethylene which has been chlorinated,

but chlorinated butadiene, etc., may be used, as well as the chlorinated product of a copolymer of isobutylene and butadiene. Such chlorinated polymerized product having a molecular weight of 60,000 to 80,000 is wetted with 5% of carbon tetrachloride and ground into powder. This wetted powder is placed in trays in layers 2 to 3 inches thick, placed in a vacuum oven, and heated at about 100° C. under a pressure of 20 minutes Hg. for 3 to 4 hours to obtain granulated expanded powder having an apparent density of 0.1.

Thomas et al—U. S. Pat. 2,276,893—March 17, 1942. *Butadiene Copolymers.* (Assigned to Standard Oil Development Co., New York, N. Y.).

Copolymers of mono-olefines with di-olefines (such as isobutylene with butadiene, etc.) are obtained by dissolving aluminum chloride in a low molecular weight alkyl halide solvent having a freezing point below —40° C., cooling this solution below —40° C., and atomizing the cooled solution into a polymerizable liquid containing at least 70% of isobutylene and 30% of butadiene, these polymerizable compounds having been diluted with 100 to 200% of a normally liquefiable gaseous hydrocarbon, boiling as low as the copolymerization temperature of the olefines mixture. Specific examples for producing this type of copolymers are given. The copolymeric material, after its formation and separation from the solvent, is immersed in isopropyl alcohol, kneaded at 130° C., or worked with sodium hydroxide solution and kneaded cold. A vulcanizate having great tensile strength and elongation is obtained by mixing the formed copolymer (100) with gas black (50) or titanium oxide (20), sulfur (41), Butyl Zimate (1.5), Captax (0.5), zinc oxide (5), and stearic acid (3), and vulcanizing by heating at suitable temperature and pressure.

Reynolds—U. S. Pat. 2,276,874—March 17, 1942. *Cellulose Ester Products.* (Assigned to Standard Oil Development Co., New York, N. Y.).

An acid and alkali-resistant cellulose ester composition comprises cellulose acetate, cellulose butyrate, ethyl cellulose, etc., and a halogenated saturated aliphatic polymer having a molecular weight above 1,000, an iodine number below 50, and a chlorine content of 10 to 50%, the mixture being dissolved in a neutral non-volatile solvent for the cellulose derivative and a chlorinated polymer comprising a high boiling ester and a volatile solvent, the high boiling point solvent being in amount sufficient to keep the solids in clear solution upon evaporation of the volatile solvent. The amount of halogenated polymer should range from 20 to 40% of the solids in the solution. Chlorinated polyisobutylene is the preferred halogenated polymer, but chlorinated hydrogenated rubber or chlorinated copolymers of butadiene and isobutylene obtained at temperatures below —50° C. in the presence of boron fluoride as catalyst may also be used. In one example, the coating composition comprises nitrocellulose (6), the chlorinated aliphatic hydrocarbon polymer of 50% chlorine having a molecular weight between 5,000 and 10,000 or more (6), and tricresyl phosphate (6) dissolved in a liquid solvent consisting of ethyl acetate (10), butyl acetate (8), and butyl alcohol (5). In another example, the coating material comprises ethyl cellulose (6), chlorinated polymerized hydrocarbon of 50% chlorine (4.8), and tricresyl phosphate (6) dissolved as above. The volatile solvent in these examples may comprise toluol (25) and petroleum oil obtained by extracting an oil distillate with sulfur dioxide at 200° to 275° C. (4). The plasticizer may be benzyl benzoate, methyl cyclohexyl adipate, etc., instead of tricresyl phosphate.

Schnabel et al—U. S. Pat. 2,277,259—March 27, 1942. *Plasticized Polyvinyl Alcohol.* (Assigned to Resistoflex Corp., Belleville, N. J.).

This patent deals with the plastification of polyvinyl alcohol resins with a "mechanical plasticizer" from the group consisting of drying or semi-drying oils, synthetic rubber from butadiene, etc., with or without other plasticizers, such as ethanol acetamide, lauryl or cetyl alcohol, Vistanex, etc. Twenty-eight plasticized polyvinyl alcohol compositions using the various types of "mechanical plasticizers" are given, three examples using the synthetic rubbers as follows:

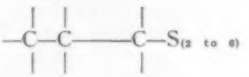
I—Polyvinyl alcohol resin (100) is plasticized with a 20% neoprene latex (50), glycerine (35), mineral oil (2), turpentine (2), oxidized linseed or menhaden oil (7), polyvinyl alcohol (1.2), and water (26.8), the bulk of the resin being in the form of powder.

II—Polyvinyl alcohol resin in the form of film containing 57% of the resin and glycerine as plasticizer is masticated with 10 parts of Perbunan to obtain a product in which the buna rubber is uniformly dispersed and its particles covered with a film of the polyvinyl alcohol resin.

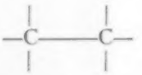
III—About 75 parts of the same polyvinyl alcohol resin used in (II) are milled with 25 parts of Perbunan previously plasticized with 10 parts of tricresyl phosphate to obtain a mass in which the Perbunan particles are coated with the vinyl resin. Copolymers of butadiene and styrene (Buna S) may be used instead of Perbunan.

Patrick—U. S. Pat. 2,278,127—March 31, 1942. *Polysulfide Plastic Products.* (Assigned to Thiokol Corp., Trenton, N. J.).

The oil resistance of polybutadiene rubber is enhanced by admixing therewith a polysulfide plastic of the ether type having the formula



in which



represent carbon atoms joined to and separated by an intervening structure. The production of such a plastic is described in the patent. In one example, ether polysulfide plastic of this type (5) is compounded with a butadiene rubber (100), carbon black (60), zinc oxide (5), pine tar (3), stearic acid (2), sulfur (2), and benzothiazyl sulfide (1). The relative quantities of the Thiokol ether and the butadiene rubber may be varied considerably, the quantity of Thiokol ranging from 2 to 100% of the quantity of the butadiene rubber. The mixture of these synthetic rubber-like products may contain sulfur or other vulcanizing agents, including the perborates, chromates, benzoyl peroxides, organic nitro compounds, etc. According to the patent, the use of the above polyethylene polysulfide ether type plastic prevents blooming on the vulcanized butadiene rubber.

Frost—U. S. Pat. 2,278,368—March 31, 1942. *Polysulfide Plastics.* (Assigned to Silesia Ver. Chem. Fabriken, Germany).

This patent describes and claims the production of a polysulfide plastic by reacting ethylene dichloride with an alkali polysulfide in the presence of 0.1 to 5% of a chloroparaffine. The chloroparaffine, which includes pentabromopentane, chlorinated or brominated benzine, polyvinyl chloride, chlorinated or brominated rubber, etc., is said to be capable of reacting with the polysulfide plastic at more than two linkages. In one example, 230 parts of ethylene dichloride containing 5% of rubber is treated with 1 part of bromine to obtain a brominated rubber in solution, this solution being diluted with 230 parts of ethylene dichloride and caused to react with a sodium polysulfide in the presence of a colloidal magnesium hydroxide, thereby obtaining a polysulfide plastic which is washed with water and dried. Such a polysulfide plastic (100) is compounded with smoked rubber (20), soot (5), sulfur (0.75), stearic acid (0.5), paraffine wax (0.5), diphenyl guanidine (0.25), and mercaptobenzothiazole (0.25), and cured at 140° C. for one-half hour to obtain an improved plastic having great tensile strength, elongation, and hardness.

Campbell—U. S. Pat. 2,278,424—April 7, 1942. *Textile Rolls.* (Assigned to Sonoco Products Co., Hartsville, S. C.).

A textile roll of the type used in drafting and working fibre slivers and rovings, etc., is provided with a cylindrical cover made as follows: A cylindrical member is made from a composition of a synthetic polyvinyl chloride rubber-like material (as described in U. S. Pat. No. 1,929,453) or from a polychloro-

prene rubber (as described in U. S. Pat. No. 2,012,223). A similar cylindrical element is separately made from a textile fabric. The fabric cylinder is then disposed coaxially within the cylinder of the synthetic rubber, in contact with its inner periphery. The fabric portion of the composite tube and a portion of the synthetic rubber tube adjacent to the surface of the fabric are heated locally at such a temperature that the synthetic rubber portion becomes plastic and tacky and is bonded to the fabric while the outer periphery of the rubber tube is not affected by the heating. Before this formed composite tube is forced over the metal cylindrical core of the roll, the inside fabric surface is sized with an adhesive glue or other cement and then forced over the metal core and dried.

Dickson and Stafford—U. S. Pat. 2,278,649—April 7, 1942. *Play Ball.* (Assigned to A. G. Spalding & Bros., Inc., Chicopee Falls, Mass.).

A play ball, such as a baseball, comprises an inner core of compressed kapok and an outer cover of a rubber composition containing at least 25% of a modifying material from the class consisting of polyisobutylene, polyxylene, polyalkylene polysulfide, and polyvinyl chloride. Several formulas of the outer cover are given. In one, the composition of the cover comprises natural rubber (10), Vistanex (80), Thiokol (200), ground cork (100), D.P.G. (6), Tuads (3), zinc oxide (15), gas black (12), stearic acid (6), and sulfur (9). A ball with a composition cover of this type has a rebound of about 11 inches.

Garvey et al—U. S. Pat. 2,278,777—April 7, 1942. *Bonding Polyvinyl Chloride to Polybutadiene Rubber.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Polyvinyl halides, particularly the plasticized gamma-polyvinyl chloride of U. S. Pat. No. 1,929,453, is bonded to a copolymeric butadiene containing from 0 to 35% of acrylic nitrile, the latter having the structure

$$CH_2 = C(R)-CN$$

in which R may be the hydrogen, methyl, isopropyl or ethyl group. The two materials, in the form of sheets, may be bonded by superposing and subjecting them to heat and pressure. Or either or both of the sheets may be treated with a suitable solvent, and then joined. Or an adhesive cement of either material may be applied to one or both faces of a sheet of the other material and several sheets joined together. In a specific example, a vulcanizable copolymer from 75% butadiene and 25% acrylic nitrile (100) is compounded with gas black (80), zinc oxide (5), cumar resin (10), sulfur (2), accelerator (2), and dibutyl phthalate (30), and is then sheeted, and another sheet from a mixture of polyvinyl chloride (60.3), dibutyl phthalate (37.7), and lead silicate (2) as stabilizer is superposed thereon, the composite sheet being heat pressed at 307° F. for one-half hour to produce an integral laminated sheet. Better results are obtained by treating the copolymer layer with a solution of dibenzyl ether (30) and methyl ethyl ketone (70) to render the face to be joined tacky. The two materials may also be used in the form of tubes which may be laminated and integrated by heat and pressure to form a tube having high resistance to oils and ozone.

Sarbach—U. S. Pat. 2,278,802—April 7, 1942. *Bonding Natural Rubber to Butadiene Rubbers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Natural rubber is bonded to a copolymer of butadiene and acrylic nitrile, the latter having the general formula

$$R-C(CH_2)-C(=O)-OR_2$$

in which R may be hydrogen or a lower alkyl radical and R_2 an alkyl radical of lower carbon atoms. Such acrylic compounds include the methyl, ethyl and butyl acrylates or methacrylates, and can be added to the butadiene in quantities from 30 to 50%. The butadiene copolymer may be compounded with a quantity of natural rubber, using from 60 to 80% of the copolymer and 40 to 20% of natural rubber. An intermediate bonding layer containing 50 parts of the copolymer of butadiene with methyl methacrylate and 25 parts of the copolymer of butadiene with acrylic nitrile and 25 parts of natural rubber may be used. In one example, the layers to be joined consist of the following:

A—An emulsion copolymer of butadiene with 45% of acrylic nitrile (75), natural rubber (25), polymerized cashew nut shell liquid—Cardolite 816 (25), zinc oxide (5), channel black (50), antioxidant (1.5), lauric acid (1.5), sulfur (2), and benzothiazyl sulfide (2) is sheeted to form an outer layer.

B—An emulsion copolymer from 70% butadiene and 30% methyl methacrylate (75), natural rubber (25), Cardolite 816 (25), channel black (50), zinc oxide (5), antioxidant (1.5), lauric acid (1.5), sulfur (3.5), and accelerator (1.5) is used as the intermediate layer.

C—A masticated crepe rubber (100), Cardolite 816 (25), carbon black (50), zinc oxide (5), sulfur (3.5), accelerator (0.8), lauric acid (1.5), and antioxidant (1.5) is sheeted to form the inner layer.

Each of the Stocks—A, B and C—is sheeted to about 5/32 inch thickness and plied in the same A-B-C order. The composite sheet is heat cured in a press at about 300° F. with sufficient pressure to consolidate and join the plies. The C layer in this structure may be from a composition containing natural rubber (75), emulsion copolymer from 70% butadiene and 30% methyl methacrylate (25), Cardolite 816 (25), channel black (50), zinc oxide (5), sulfur (3.5), accelerator (0.75), lauric acid (1.5), and antioxidant, such as phenyl-beta-naphthylamine (1.5). Composite products of this type are especially useful in the manufacture of gasoline hose, in which the inner layer is from the oil-resistant ply of type A.

Crawford—U. S. Pat. 2,278,833—April 7, 1942. *Polychloroprene Products.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Neoprene is mixed with a plasticized polyvinyl chloride to obtain a product which will neither shrink nor swell when in contact with oils. The mixture is best produced by preparing a vulcanizable stock of the neoprene, working the polyvinyl chloride with a plasticizer on a heated milling machine or mixer, and then compounding the two materials. Thus, in one example, polychloroprene (100), litharge (20), rosin (5), magnesium oxide (3), maleic acid (2), and phenyl-beta-naphthylamine (2) is mixed into a uniform mass. A gamma polyvinyl chloride in the form of powder (100) is admixed with lead silicate (3.5) as stabilizer, and with a plasticizer (75), and the resulting pasty mass is transferred to a hot roll milling machine and milled into a tough mass. About 36 parts of the neoprene mixture are added to the plasticized polyvinyl chloride and the combined mass cured in a mold at 320° F. for about 20 minutes to obtain a resilient, rubber-like product. In another example, the gamma polyvinyl chloride is fluxed with a plasticizer as above in the ratio of 300:110 and admixed with 100 parts of the above neoprene stock, and cured at 287° F. for about 45 minutes.

Frolich—U. S. Pat. 2,278,982—April 7, 1942. *Printing Rolls.* (Assigned to Standard Oil Development Co., New York, N. Y.).

A printing roll or transfer blanket comprises a vulcanized interpolymer of isobutylene with butadiene produced from 20 parts of butadiene and 80 parts of isobutylene in the presence of aluminum chloride as catalyst at temperatures between —50° C. and —180° C. Such an interpolymer (100) is compounded with blanc fixe (50), zinc oxide (25), titanium oxide (25), sulfur (5), stearic acid (5), benzothiazyl disulfide (3), and tetramethyl thiuram disulfide (1). This uniform mixture is molded about a metal axle and cured at 160° C. for four hours to obtain a surfacing layer which is resistant to inks, oxygenated solvents, etc., and which may be cleaned with alcohol, acetone, soaps, etc., and is also resistant to abrasion and flexing. In another example, the composition contains 40 parts of the above interpolymer which are admixed with blanc fixe (25), zinc oxide (25), stearic acid (5), sulfur (2), Altax (3), and Tuads (1), to produce a softer inking roll.

(To be Continued)

Editorials . . . . . .

Permanent Licenses

THE action of the Standard Oil Co. of New Jersey in offering to provide the Government with its Buna S patents on a permanent basis, with the option of extending such patents on a similar basis to any American manufacturer who in turn offers his own patents in like wise, raises a number of interesting questions, some of them concerned with the post-war period. Since the existing rubber pool already gives American manufacturers free use of synthetic rubber patents during the war, the probability is that the post-war implications of Standard's move are of more importance than any at present.

There is a good possibility that the action—believed to be unprecedented—will place the bulk of the post-war synthetic rubber industry in the lap of the Government. In fact, there are reports in some quarters to the effect that gentle pressure was exerted by Government officials on Standard Oil before the offer was made. On the other hand, however, there is talk that the terms of the final peace may eliminate any large scale synthetic rubber industry in the United States since it might provide for the rubber market to be turned back to the plantations of the British and the Dutch, with a piece retained for South America. Recent declarations of Vice-President Henry Wallace lend credence to such talk.

In addition to providing the Government with all rights to its Buna S patents on a permanent basis, with the right to license other manufacturers during the war, but not after the war, on a royalty-free basis, providing such manufacturers reciprocate with similar licenses under their own patents, the Standard proposal also provides for a $5,000,000 research program on synthetic rubber under Government jurisdiction. This would seem to indicate that a permanent, dominant synthetic rubber patent pool controlled by the Government and primarily based on Government research is in the offing, providing that the other important factors in the Buna S picture are agreeable. Both Firestone and Goodyear have already signified their intention of joining the new pool, but Goodrich as yet has made no commitment.

It also seems clear that if the proposed pool is to be effective in the post-war period it would have to include several large organizations—such as DuPont and Shell Development—whose patents like all others are available to the Government during the prosecution of the war, but which are not involved in the present patent pool maintained by Rubber Reserve. To prove really effective, it would seem that practically all of the more important synthetic rubber-like materials would be required to be involved in the pool, even though for the present Buna S represents the most important synthetic from the standpoint of production and use.

Although Standard's offer has been met with some skepticism in some quarters, there seems to be little doubt that it was made in good faith. Standard Oil, we believe, is far more interested in the sale of gasoline and accessory materials to rubber-borne transportation than it is in profits from the production and sale of synthetic rubber. Likewise, there is little doubt that adoption of the proposed pool would result in greater technical achievement in a shorter period of time.

There is, however, one little hitch to the newly-suggested pool. Unless all members of the pool—including Standard Oil—commit themselves to free use of all future discoveries the entire program might soon be thrown completely out of line. It is not only possible, but quite plausible, that some entirely new type of synthetic rubber, discovered by some relatively insignificant laboratory, may some day come along. The day of American ingenuity has by no means passed.

Detroit Meeting

THE meeting held by the Rubber Division, A.C.S., in Detroit last month was not only record-setting insofar as attendance is concerned, but was one of the best held to date from the standpoints of technical papers presented and facilities for such presentation. The technical sessions were sufficiently varied and important to attract large audiences, the presentation of the Goodyear Lecture by Dr. Sebrell alone drawing an audience of well over a thousand. One or two papers, however, seemed overly long, and a good deal of squirming was very evident at times. It might be a good idea for the Committee on Papers to regulate the time allowed for the presentation of technical papers. After all, even an author loses out when his audience becomes too fretful.

CURRENT NEWS OF THE MONTH

SYNTHETIC RUBBER CONTROVERSY AGAIN OCCUPIES SPOTLIGHT AS CHARGES FLY

THE synthetic rubber controversy, particularly with regard to the question of priorities, flared up again in the past few weeks, and once again charges flew thick and fast, some of them very serious in nature. The controversy involved Rubber Director Jeffers, Undersecretary of War Patterson, Secretary of the Interior Ickes, and Donald Nelson, WPB chairman. Mr. Jeffers, as usual, was right in the midst of all arguments, and firmly refuted every charge levelled at the overall rubber program. In addition, Mr. Jeffers was involved in a bitter argument with Elmer Davis, chief of the Office of War Information, over a special release on the status of the rubber program released by that Office. At this writing (May 13) a "temporary truce" exists all around and it is hoped that the question of priorities will soon be settled for the duration of the war.

The latest controversy started on April 21 when Undersecretary Patterson, who bitterly fought the award of special priorities to the synthetic rubber program some three months ago, charged that the Allied air attack on Nazi Europe would shortly be weakened by a serious shortage of 100-octane gasoline unless drastic action was taken immediately. Directly responsible for this situation, according to statements attributed to both Mr. Patterson and Secretary of the Interior Harold Ickes, who is also the War Petroleum Administrator, is the competitive clash between the 100-octane gasoline and synthetic rubber programs for certain vital, scarce machinery.

In other circles, it was intimated that Rubber Director Jeffers has been so intent on making a record in synthetic rubber that he has taken machinery needed for both combat gasoline and for escort ships at a time when both were vitally needed for a successful offensive overseas. The items particularly in controversy are critical components for plant operation, such as heat exchangers, valves, and special pumps. A confidential report made to Secretary Ickes is believed to have shown that 100-octane plants were being held up while machinery needed to complete them was being shipped to the synthetic plants.

Jeffers Threatens Showdown

Rubber Director Jeffers' reaction to these charges was immediate. On April 22 he issued a formal statement in which he said that the charges "are so serious and so directly affect the war effort and the American people, and might contribute so materially to the comfort of the enemy" that he demanded "an immediate investigation to bring out the true facts for presentation to the 130,000,000 Americans referred to by the Undersecretary of War." A spokesman for the Office of the Rubber Director, at the time, intimated that Mr. Jeffers was the "maddest Irishman in the entire country" over the charges and threatened a real showdown—his resignation or that of Mr. Patterson.

Senate Launches Investigation

Shortly after the charges were made, and refuted by Mr. Jeffers, the special Senate committee investigating the war program, headed by Senator Truman, of Missouri, generally called the Truman Committee, stepped into the breach and launched an immediate investigation of the charges. Appearing before this committee on April 27, Donald Nelson, WPB Chairman, denied the allegations that allocations of critical materials to the synthetic rubber program last December entailed such shortages of gasoline as to threaten the success of any impending air offensive against the Axis. He alleged that if any such shortages were impending, they were the result of improper distribution of supplies of high-octane gasoline rather than an outright shortage.

In setting the schedule for synthetic rubber production, Mr. Nelson stated, he was compelled to weigh a steadily diminishing crude rubber stockpile against the creation of facilities to get the synthetic product produced in at least minimum essential volume to prevent a situation which might become a "national disaster." Awarding of high priorities to 55% of the overall synthetic rubber program admittedly interfered with the production of 100-octane gasoline, he said, but it is not too late to make up the losses in aviation fuel if cooperation between agencies replaces rivalry and bitter contests.

Appearing before the committee on May 3, Undersecretary Patterson surprised the committee by completely avoiding invectives and announced a new plan of coordination to take the place of the competition for high priorities. He stated that after a quiet series of conferences with the principals involved, it had been decided to make a tour of all of the plants involved and seek to work out all differences cooperatively, plant by plant. This tour will be made by Mr. Patterson, Mr. Jeffers, James V. Forrestal, Undersecretary of the Navy, and an official from the office of Secretary Ickes.

Mr. Patterson, however, took sharp issue with statements made by Messrs. Ickes and Nelson to the effect that the shortage of 100-octane gasoline for use in combat planes was not as critical as he, Mr. Patterson, had pictured it.

Mr. Jeffers appeared before the Truman Committee on May 4 and stated that he was pleased to follow the peaceful means of cooperation and settlement offered by Undersecretary Patterson. He added that "the only accusation made against the rubber program is that my associates and I have done our job well—perhaps even too well" and commented that this accusation was actually "the first official commendation I have had since I have been in Washington."

Claims Program Months Ahead

Referring to the specific charges previously made, Mr. Jeffers stated that preferences granted to the rubber program had in no way retarded production of gasoline for fighting planes. "The 100-octane gasoline program," he said, "is months ahead of what it would have been if it had not been for activities of my organization in breaking bottlenecks and finding new sources of supply for both programs." He also declared that further curtailment of the rubber program would be "a tragic error" and denied that the civilian population was being "coddled," adding that "We believe in the honesty and integrity of the American people, and if that is coddling, I suppose we have coddled them."

In reporting the findings of its special investigation to the Senate on May 6, the Truman Committee reported that the basic faults in the priorities conflict lay in the weaknesses in the control of the war effort. The committee stated that there were too many "Czars," men who had been assigned to attain specified ob-

jectives and received independent powers drawn from the overall authority, an authority "which should show clear leadership and, if necessary, knock heads together to get things done."

The powers of WPB, it was said, look better on paper than in practice. The committee urged that the strong overall authority of WPB be made a "living reality."

Jeffers and Davis Clash

On April 17, the Office of War Information issued an 11-page review of the rubber situation. Rubber Director Jeffers immediately took issue with this release, stating that it was "a month late," that its "arithmetic is all wrong," and because he believed it would be "confusing and misleading" to the public. Elmer Davis, OWI chief, then accused Mr. Jeffers of trying to stop OWI from telling the American people "facts about rubber which had been certified by his own office."

The report in question indicated that the great bulk of 27,000,000 civilian passenger car owners cannot expect synthetic rubber tires before the last half of 1944 and that further mileage curtailment would be necessary to conserve existing tires. Mr. Jeffers recently testified that it may be possible to distribute about 5,000,000 synthetic rubber tires this year. He added, further, that "I saw no point in the publication of a story which was simply a rehash of my Report No. 2, released on February 18."

Stressing the fact that the report had been approved by officials of the Office of the Rubber Director and that Mr. Jeffers had refused to point out any factual statement which he believed wrong, simply asking that the entire story be suppressed, Mr. Davis stated that "so long as I am here I propose to tell the people the truth as accurately as I can ascertain it."

In the meantime, it is the consensus of the rubber industry itself that rationing restrictions will be continued through the balance of this year, that pleasure driving will be banned for the duration, that synthetic rubber production will be in excellent shape by the end of the year, and that synthetic tires for essential civilian use will appear on the market within the next two or three months.

Whiteside Directs Civilian Use

The administrative order setting up the Office of Civilian Requirements within the WPB was issued by Chairman Donald Nelson on May 1. This new office is clothed with power necessary to provide civilians with all essential goods and services, except food, housing and transportation. It is headed by Arthur D. Whiteside, president of Dun & Bradstreet, Inc.

Under the terms of the order setting up the new Office, Mr. Whiteside apparently has the authority to decide what civilian requirements for rubber are, what kind of rubber civilians should get, and whether it would be in the form of passenger car tires, truck tires, garden hose, or any other form. Because of this authority, it was believed that the authority of the new Office would soon clash with that of Rubber Director Jeffers.

Mr. Nelson made it clear, however, that in questions involving the distribution of rubber for tires or other civilian end use purposes, Mr. Whiteside will review the arrangements made by the Office of the Rubber Director and would report his findings to the WPB chairman. He has the authority, however, to direct that changes be made if necessary. Should a difference of opinion develop between the two offices, then Mr. Nelson would act as the arbiter.

It was also made clear that Rubber Director Jeffers remains completely responsible for the development of the rubber program and will determine how much can be made available for civilians and continue the distribution of rubber to the manufacturers making civilian goods.

Amend Distribution Instructions

Rubber Reserve Co. has issued Circular No. 19, supplementing and amending the distribution of all types of rubber as covered by Circular No. 17 (which was published in full in our last issue). A number of minor changes, concerned with the executing of the necessary documents and freight charges, are contained in the new circular, the more important modifications being as follows:

(1) Although Circular 17 specified that only one purchase permit will be issued unless the amount of synthetic rubber allocated by WPB is in excess of a carload lot (approximately 60,000 pounds), an exception will be made in cases where the purchaser desires to have the material shipped to more than one manufacturing plant operated by such purchaser, provided the Sales Department of Rubber Reserve is advised by telegraph to this effect immediately upon receipt of advice by the purchaser from WPB of the amount allocated. In cases of this nature, separate purchase permits will be issued upon receipt of the purchaser's request.

(2) Purchasers will be permitted to consolidate two or more permits covering the purchase of crude rubber, balata, guayule, synthetic rubber or liquid latex, in order to effect shipments in carload lots, provided that with respect to synthetic rubber the material covered by the permits is to be supplied by the same Agent of Rubber Reserve and insofar as crude rubber, balata, guayule or latex are concerned, satisfactory arrangements are made with the Distributing Agent or the Latex Agent of Rubber Reserve.

Selling Method Revised

Because of the accounting difficulties with which manufacturers would be faced in purchasing rubber on the basis of the prices set forth in Circular No. 17, which provides two sets of prices for "Civilian Use" and for "Other than Civilian Use," Rubber Reserve has amended its procedure for the sale of crude rubber, guayule, and latex. The amended procedure is covered in Circular No. 20, issued on April 30.

Effective with all purchase permits issued on and after May 1, Rubber Reserve will sell crude rubber, guayule and latex to manufacturers on a conditional price basis, the original prices to be those set forth in Circular No. 17 under the column designated "Civilian Use," subject to the payment of an adjusted price. Uniform freight charges will be added to the selling prices.

Each manufacturer will be required to show on his monthly report to WPB (Form PD-49) the quantity of crude rubber, guayule and latex which was used in the manufacture of end products delivered or invoiced on War and Civilian Orders. The report dated July 31, 1943, will cover end products delivered or invoiced during the month of June. Reports dated on the last day of succeeding months will cover end products delivered or invoiced during the preceding calendar month.

A copy of the monthly report (Form PD-49) should be mailed to Rubber Reserve together with a certified check or banker's New York draft payable to Rubber Reserve in an amount equal to 17½c multiplied by the number of pounds of crude rubber, guayule or latex used in end products delivered or invoiced on War Orders. This amount will represent the unpaid part of the adjusted purchase price owed to Rubber Reserve. No adjustment of the purchase price shall be made with respect to those quantities of crude rubber, guayule and latex shown on the monthly report to have been used in the manufacture of articles for civilian use.

Those manufacturers who have purchased crude rubber, guayule and latex from Rubber Reserve at the prices set forth in the column designated "Other than Civilian Use" in Circular No. 17, which became effective April 1, should prepare a debit memorandum against Rubber Reserve, computed on the total of such purchases at the difference between the prices shown in the columns designated "Civilian Use" and "Other than

Heels for Paratroops

Soft, especially-developed heels are used for the boots worn by paratroops of the U. S. Army, it has been disclosed by the Goodyear Tire & Rubber Co., major producer of the special type heels. These heels have a wedge shape at the instep rather than the conventional straight edge design, thus obviating the shock and snapping effect which would result if the breast of the heels was in the customary straight edge shape. The wedge effect also permits the heel to slide over any obstacle which a paratrooper might encounter when dragged over the ground after landing.

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Civilian Use." The debit memorandum should be attached to the copy of the monthly report (Form PD-49), dated July 31, which is mailed to Rubber Reserve, as previously mentioned.

Such manufacturers shall deduct from the amount owing to Rubber Reserve, as explained above, the amount of the debit memorandum attached to the report and shall accompany that report with a certified check or banker's New York draft covering the balance due. In the event that the amount of the debit memorandum is greater than the amount due Rubber Reserve, the excess may be similarly deducted for the next ensuing month or months.

Because of this change in procedure, the words "Civilian" or "Non-Civilian" will not appear on purchase permits issued on or after May 1. All requests for the issuance of purchase permits should be addressed to the Office of the Rubber Director as before. Deliveries of crude rubber, guayule and latex will be made in the manner prescribed in Circular No. 17.

(EDITOR'S NOTE: In view of the change in the basis of billing plantation, guayule and wild rubbers made by Rubber Reserve, the members of the Rubber Trade Association of New York have agreed to revise their service charges. These charges now range from 1/16c per pound for 750 tons and over of plantation, synthetic, guayule and wild rubbers to 2½c per pound for less than 1 ton, and from ½c per pound for 750 tons of balata to 4c for less than 1 ton.)

BUNA S PATENTS OFFERED TO GOVERNMENT ON PERMANENT BASIS

In an unprecedented move, the Standard Oil Co. of New Jersey on April 21 announced that patent rights on Buna S will be given permanently to the Government, subject to the Government's acceptance and stockholders' approval of the offer. Buna patents, under the special Government pool, are now available to industry royalty-free for the duration of the war.

The patent rights were offered to the Rubber Reserve Co. Under the terms of the proposal, the Government would have a free license for itself, not only for the war but for the life of the patents as well. Rubber Reserve, in addition, would have the right to issue free licenses to any company cooperating with the Government in its war program and which reciprocates with similar licenses under their own patents. The right of Rubber Reserve to issue licenses would terminate with the end of the war, but licenses issued during the war would continue for the entire life of the patents. No payments would be made to Standard Oil or to others for the patents used.

The proposal also calls for the Government to increase its expenditures for research in the synthetic rubber field up to an aggregate amount of not less than $5,000,000. The results of such research would be made available to all cooperating patent users, subject at present to Government wartime secrecy requirements. The plan has received the approval of Rubber Director Jeffers.

Details of the proposal, believed to be the first of its kind ever offered to the Government, were revealed by Ralph W. Gallagher, president of Standard Oil (N. J.), at a press conference held on April 21 at the company's headquarters in New York City. The purpose of the proposal, Mr. Gallagher explained, was four-fold, as follows:

(1) To give every possible incentive to cooperation in the war program; (2) To remove concern about the post-war patent situation from the minds of all those who have a contribution to make to this program; (3) To encourage American research and ingenuity — among independent workers, smaller companies and large—to build up a new and great American industry; and (4) To continue to do everything possible to assure tires for America's cars at all times.

The Standard Oil offer was favorably received in rubber circles. Firestone and Goodyear immediately agreed to the fundamentals of the proposal and, in telegrams to Rubber Director Jeffers, signified their intention of joining in the arrangements. At this writing (May 13) no commitment has been made by Goodrich.

National Plant at Louisville

The fifth synthetic rubber plant in Louisville, Kentucky, will begin operations about mid-summer, according to a statement by Dr. B. J. Oakes, executive vice-president of the recently-organized National Synthetic Rubber Corp. This plant, government-owned, will be operated by the company. Construction is being rushed at the highest possible speed and no delay due to essential equipment is foreseen.

The opening of the synthetic rubber plant to be operated near Houston, Texas, by the General Tire & Rubber Co., in conjunction with the General Latex & Chemical Co., is to be made a day of general celebration by the entire state of Texas, according to a recent announcement by General. June 28 has been proclaimed as "American-Made Rubber Day" by Governor C. R. Stevenson and elaborate plans are being made for the occasion.

General Tire, it was also announced, has established a synthetic rubber division which will be directed by an operating committee consisting of Mr. O'Neil and Fred Mayfield, of General Tire, and H. Stuart Hotchkiss and Warren MacPherson, of General Latex. Harvey J. Elwell, president of General Latex, was recently named general manager of the plant to be opened in Texas.

Richardite Synthetic Rubber

Some interest is being expressed in a new process for producing synthetic rubber developed by two brothers, Thomas and James Richards, in Glendale, California. Called "Richardite," the new synthetic is said to differ radically in production procedure from most of the synthetics, and although no details have been released on its composition it is believed to be based on soya bean oil.

Experiments have been conducted with the new material for use in retreading and in the production of certain molded goods, including heels. In the latter connection, it is reported that the process permits making the heels any desired color.

THIOKOL N

According to Circular No. 18, issued by Rubber Reserve on April 7, Thiokol N, designated GR-P by Rubber Reserve, will be sold by that company at 30c per pound for use in the manufacture of permitted or presently non-permitted end products wherever such use is feasible within the limitation of existing maximum prices established by OPA. It will be sold at 4c a pound for use in the manufacture of permitted end products in cases where it replaces all or a part of the reclaimed rubber content of such end products.

GR-P will be delivered f.o.b. producing plants or ex warehouses at the option of Rubber Reserve, and a uniform freight charge of ½c per pound based on net delivered weight for carload quantities or 1c per pound for less than carload quantities will be added to the base figures. Wherever GR-P is used in the manufacture of camelback or other permitted end products, it either replaces reclaimed rubber or extends the manufacturer's reclaimed rubber allocation. Manufacturers, it was pointed out, should assume the responsibility of limiting sales to those outlets which have been educated to the use of end products processed from GR-P.

The circular makes it clear that the amount of GR-P which a manufacturer purchases will not be charged by the Office of the Rubber Director against the manufacturer's allocation of synthetic, crude or reclaimed rubber, but will represent an addition thereto. All requests for the purchase of the material should be addressed to the ORD and should state specifically the end product which will be involved and the amount of synthetic, crude or reclaimed rubber which will be replaced thereby. Distribution to manufacturers will follow the procedure previously outlined by Rubber Reserve.

(EDITOR'S NOTE: The Rubber Trade Association of New York, in a memo sent to all rubber manufacturers on May 5, pointed out that although GR-P was not specifically mentioned in Rubber Reserve's Circular No. 17, the assistance and services of Dealer Agents in arranging purchases and deliveries of this material are at the disposal of the manufacturers as usual.)

Although it was reported that the production of GR-P had been halted, due to the fact that considerable stocks had been accumulated at the Deepwater, N. J., plant of DuPont, which were not moving fast enough into trade channels, the Dow Chemical Co., Midland, Mich., issued a statement on May 5 to the effect that its plant at Freeport, Texas, is being constructed on schedule. This plant will produce GR-P according to present plans, and should be in operation within a month or two. DuPont's Deepwater plant, converted from the manufacture of electrochemicals, is believed to have discontinued production of Thiokol N, at least temporarily.

RAW MATERIALS

WPB has simplified authorization forms for the use and delivery of the three basic ingredients—butadiene, styrene and acrylonitrile—in manufacturing synthetic rubber. Form PD-602 may now be used in place of the two previous forms required—PD-600 and PD-601. Simplification was accomplished by amendments to Allocation Orders M-170 (Styrene), M-178 (Butadiene), and M-153 (Acrylonitrile).

The Chemicals Division of WPB, at the time the amendments were issued, pointed out that the filing of application with WPB for use, delivery or acceptance of delivery of styrene and butadiene in the manufacture of synthetic rubber is not required by Rubber Reserve, its contracting operators, or any plant owned by the Government.

Construction of a second plant for the manufacture of acrylonitrile was announced on April 12 by the Rohm & Haas Co., Philadelphia. The new plant, to cost approximately $300,000, which is expected to be completed in the next few months, will bring to four the number of acrylonitrile plants in operation in the United States. Rohm & Haas opened its first plant in 1940.

Some units of the Kobuta plant, which will produce butadiene and styrene, and will be operated by the Koppers United Co., are expected to begin production within the next several weeks. The plant, located in the Beaver Valley, near Pittsburgh, is the largest in the Government's program for supplying the raw materials needed for Buna S. A ferry service across the Ohio River for conveying workers has been started.

According to a statement made by Dr. Walter G. Whitman, assistant director of the WPB Chemicals Division before the special Senate agricultural subcommittee on April 20, the Government's program for expanding industrial alcohol production by the construction of new plants has been brought to an end, and construction of five projected plants to produce alcohol from grains has been deferred. The latter projects included the one planned for Keokuk, Iowa.

The anticipated production of alcohol for the next twenty months, said Dr. Whitman, substantially equals the estimated demands for the same period. In addition, the government has in the past eleven months accumulated reserve stock of over 100,000,000 gallons of alcohol. This should insure the program against unexpected increases in requirements and allow time for new construction, if unforeseen demands should develop. Almost 50,000,000 gallons of these stocks have been stored since January 1, 1943.

Dr. Whitman estimated industrial alcohol supplies for 1943 at 470,000,000 gallons against requirements of 435,000,000, and said 1944 supplies and requirements would balance at 590,000,000 gallons. This year's program for alcohol made from grain will require 135,000,000 bushels of wheat, corn and other grains, while 1944 requirements will approximate 190,000,000 bushels.

NEW INDUSTRY REGULATIONS COVER PRODUCTION, PRICES AND SALES

To avoid confusion as a result of the change in the price of crude rubber, which became effective April 1, all Federal Government purchases have been consolidated under the heading of "War Orders." This interpretation is contained in Amendment 1 to Supplementary Order M-15-b, as Amended April 13, 1943. The latter order has been reprinted in consolidated form, with all amendments up to and including April 13, and rubber manufacturers may secure copies by addressing a request to the Office of the Rubber Director.

Industry regulations on production, prices and sales, issued since our last report, divided into commodity headings for convenience, follow:

DRUG SUNDRIES

Three changes have been effected in MPR 300 (Maximum Manufacturers' Prices for Rubber Drug Sundries) by the issuance of Amendment 6 by OPA on May 6.

These are: (1) Pricing provisions are amended so that the lower price for GR-M (neoprene) shall be reflected in the manufacturers' maximum prices of certain products in which it is used; (2) Parts of the definitions of "distributor" and "manufacturer" of rubber drug sundries have been re-phrased to make them clearer, but without changing their meaning; and (3) Rubber parts of abrasive wheels and similar products now covered by MPR 316 (Coated and Bonded Abrasive Products) are excluded from the drug sundries regulations.

The abrasive products have also been removed from MPR 301 (Retail and Wholesale Prices for Rubber Drug Sundries) by Amendment 5 to that regulation, issued on the same date.

Sanitary Treated Baby Items

Pricing methods at wholesale and retail for sanitary treated baby items have been incorporated in MPR 220 (Certain Rubber Commodities) by Amendment 8 to that regulation, issued by OPA on May 7. Specifically affected are baby bibs, baby pants, crib sheets, diaper and utility bags, diaper covers, lap pads, mattress covers and coveralls, nursery seat rings, pillow cases and place mats. Lap pads and place mats are thus brought under MPR 220, at the manufacturers' level, for the first time.

Before the issuance of Amendment 8, the above items were priced under GMPR. The pricing of these items under that regulation was difficult because of the constant changes in their composition due to the shortage of materials. The new pricing action follows surveys by OPA and conferences with the industry so that OPA could be certain that industry practices and customary margins would be preserved. Wholesalers and retailers are prohibited from selling the commodities named until they have been supplied with the appropriate maximum prices by the manufacturer of the person from whom they obtain the commodities.

Copper Use Clarified

The Copper Division of WPB pointed out on April 22 that the use of copper in hot water bottles, syringes, ice caps, bulbs, and similar supplies commonly referred to as "rubber hospital sundries" is restricted but not completely prohibited by the terms of Copper Order M-9-c. Applicable rules governing the use of copper and copper base alloy in such products include the following:

(1) If the copper material was acquired before June 30, 1942 it may be used in rubber hospital sundries only on orders rated AA-4 or higher. However, application may be made to WPB, on Form PD-426, for authorization to fill lower rated orders.

(2) If the copper was acquired after June 30 it may be used in the manufacture of rubber hospital sundries without preference ratings subject to the following conditions:

(a) Copper may not be used where the use of a less scarce material is practicable.

(b) The use of more copper material or copper of a higher grade than is necessary for the proper operation of the article to be manufactured is prohibited.

Special Sundries Orders

Allied Latex Corp., East Newark, N. J., is permited to sell its special type prophylactic at a price not in excess of $2.45 a gross when packaged in match-folder packages and $2.75 a gross when packaged in tins under Order No. 2 of MPR 300, issued by OPA on April 19.

Special prices for neoprene bulbs manufactured and sold by the Acushnet Process Co., New Bedford, Mass., have been established by OPA by Order No. 3 to MPR 300.

BOOTS AND SHOES

Over-the-knee olive-drab, clay and khaki colored rubber boots—the kind worn in hunting and fishing, have been released from the rationing restriction of RO 6 (Men's Rubber Boots and Rubber Work Shoes) by Amendment 10, issued by OPA on April 21. Boots of this kind, which are not heavy enough for workmen, are no longer being produced. The existing supply, however, can now be sold ration-free. Over-the-knee boots classified as Types 1 and 2 in the original rationing order, and which in addition are of the designated light colors, are released. Below-the-knee-height boots are still under rationing control regardless of color.

In a separate simultaneous action OPA has instructed local War Price and Rationing Boards to add to their list of persons eligible for the rationed men's rubber boots and rubber work shoes, anyone engaged principally in washing motor vehicles used as common or contract carriers or vehicles used in wholesale delivery of essential commodities. Workers in beverage and bottling plants who need the protection of rubber footwear are also added to the eligible list, with the further instruction that Type 4 footwear—lightweight short rubber boots—is sufficient for the needs of such workers.

Amendment 7 to MPR 220 (Certain Rubber Commodities), issued May 3 and effective May 8, adds canvas and other fabric topped footwear made with substitute rubber soles to the list of products covered by that regulation. This action removes footwear of this type from control under the GMPR, where it was necessary for producers to obtain OPA authorization each time the maximum price of a type of fabric topped footwear was established. Now, producers need merely apply the pricing method provided in MPR 220.

WIRE AND CABLE

Restrictions on the destruction of rubber-insulated wire and cable were removed by WPB on April 13 to enable more efficient recovery of the copper content of such materials. The action, taken in an amendment to Supplementary Order M-15-b, relaxes the procedure under which firms recovering copper from wire and cable were formerly required to reclaim the rubber content or make application for its destruction.

The amendment also allows destruction under special authorization, of certain types of scrap rubber, including tires, tire casings and tire tubes which have no value so far as the rubber conservation program is concerned. It also permits manufacturers of rubber products who, because of limited facilities, were forced to send their rubber to other concerns for washing, drying, and milling, to do so without first making application for the transportation of the rubber, provided actual title does not change hands.

Under the terms of Amendment 3 to RPS 82 (Wire, Cable and Cable Accessories), issued May 3 and effective May 8, OPA permits producers of rubber-covered wire and cable to quote higher than ceiling prices to reflect cost increases resulting from the authorized increase in the price of crude rubber. The action does not permit such producers to collect prices which are in excess of ceilings at the time of delivery.

Despite their quoted prices, producers will be held to ceilings which are in effect at the time of delivery, which may be lower than the prices they have quoted. The action merely allows producers to quote prices and accept orders at prices reflecting the increased price for crude rubber contained in their products without violating the schedule. Present production is not affected by the action since producers are able to purchase crude rubber at the ceilings which existed before April 1 until May 31.

RUBBER GLOVES

The distribution and sale of all rubber gloves formerly marketed as "seconds" or "rejects" has been placed under control by the issuance of Supplementary Order M-15-h on April 30, by WPB. All manufacturers of surgeons', autopsy, mortuary and industrial gloves are now required to file quarterly reports with the Office of the Rubber Director showing their percentage of "seconds" or "rejects." In addition, the new order provides that all "seconds" or "rejects" must now be sold either to fill war orders or to certain designated classes of persons, and permission must be obtained to consummate any other sale.

Under the terms of the order, surgeon's, autopsy and mortuary gloves may be sold to hospitals, clinics, surgeons, physicians, medical schools, dental schools, dentists, morticians, undertaking establishments or schools, morgues, veterinarians or veterinary hospitals or to any person regularly engaged in the business of acquiring such products for resale to these classes, but only upon certification.

Rubberized fabric gloves, net lined gloves (except hand made gloves of calendered stock), and all-rubber gloves (including electricians' gloves) less than 12 inches in length and with a gauge of less than twenty-six one thousandths of an inch may be sold to industrial or commercial users or to any person engaged in the business of reselling to such users, but only upon certification.

RUBBER HEELS

Maximum prices for rubber heels made of scrap rubber and square woven fabrics taken from garden hose, belting, raincoats, and similar materials have been established by OPA in Amendment 6 to MPR 200 (Rubber Heels, Rubber Heels Attached and Attaching of Rub-

WOMEN NOW FURNISH "MANPOWER" FOR THE BUILDING OF FISK TIRES

The above photograph shows a section of the tire building plant of the Fisk Division of the U. S. Rubber Co. at Chicopee Falls, Mass., where passenger car tires are now being built by women. Training women for tire building operations has been termed one of the most unique conversions of manpower in the industry.

ber Heels). The amendment was issued April 14 and became effective April 20.

Described as "fiber heels," the new products are to be placed in the lowest price classification for heels made after August 31, 1942, unless in actual tests they wear as well as rubber heels in a higher price classification. For example, if a man's half heel containing fibers wears as well as a V-2 rubber heel, it may be marked V-2 after securing OPA approval, and be attached by a shoe repairman at a total price of 50 cents. By comparison, the lowest classification is V-4 and costs the consumer a maximum of 40 cents a pair attached for men's half heels.

The amendment describes the wearing tests devised for fiber heels, including reports and samples to be submitted to OPA in applying for approval of a higher classification than V-4. Wear tests have been used extensively by the industry to compare the wearing qualities of heels.

Heels that contain such small quantities of fiber that they can meet the abrasion and tensile requirements for non-fiber heels may be classified according to the non-fiber heel tests. Heels made with a segment containing fibers are classified according to the quality of the base stock until May 20, 1943, and on the basis of the wear tests after that date.

Another change contained in the amendment applies to non-fiber heels. It classifies the Borman Pneumatic Heel as a "super" heel. Previously this heel was unclassified.

INDUSTRIAL TRUCK TIRES

An amendment to Supplementary Order M-15-g, covering rubber tires for industrial power trucks, was issued by OPA on April 12 extending the replacement for use period on application for new power truck tires from 15 to 30 days. Several additional changes were made by the amendment, all of a technical nature and designed to clarify the definitions in the original order.

"Industrial power truck" is now defined to mean "any self-power-propelled industrial truck or wheel tractor designed primarily for handling material (either by carrying or towing) on floors or paved surfaces in and around industrial plants, warehouses, docks, shipyards, airports or depots." The term does not include "automotive tractors, automotive trucks, wheel-type industrial tractors designed for use on tax-built highways, or in such operations as construction, earth-moving, mining, logging or petroleum development; or trailers designed for industrial use."

ELASTIC FABRICS

According to Amendment 160 to Supplementary Regulation 14 of the General Maximum Price Regulation, issued and effective April 12, the maximum price for the sale of any grade of elastic fabric by the Defense Supplies Corp. shall be 105% of the average cost of the product. Elastic fabric, in this case, means "any fabric knitted, woven or braided containing bare rubber core or covered rubber thread, including all types of synthetic rubber core or thread, six inches in width or less, of any quality or in any condition whatsoever."

CAMELBACK

Camelback has been added to the list of rubber products which sellers may agree to sell at prices higher than current maximums. The agreements should reflect only increases that OPA may make in camelback ceilings because of increased raw rubber prices which were effective April 1. This action, taken in Amendment 2 to MPR 131 (Camelback), issued and effective April 13, affects products going to the Federal Government only and not to prices to individual consumers.

CEMENTS AND ADHESIVES

Under the terms of Supplementary Order M-15-f, as Amended April 17, 1943, the covering of wood shoe heels is now a permitted operation. It is believed that polyvinyl acetate will be used in place of latex for this operation. The use of polyvinyl acetate will continue to be controlled through allocations, but since under the conditions of the original M-15-f order these allocations were limited to permitted operations only, the current amendment was found necessary to authorize the covering of shoe heels.

SCRAP RUBBER

Effective May 12, hard rubber scrap is to be priced under the General Maximum Price Regulation and not under RPS 87, as Amended (Scrap Rubber), according to Amendment 5 to the latter regulation, issued by OPA on May 6.

Classed as miscellaneous scrap rubber under Schedule 87, hard rubber scrap would be entitled to a maximum price of $15 per ton, OPA pointed out, whereas prices of such scrap ordinarily range, in accordance with its grade, from $5 to several hundred dollars per ton. The freeze technique in the General Maximum Price Regulation allows such variations in price to be taken into account.

It is provided, further, that in applying the provisions of the regulation, the Rubber Reserve Company shall consider other persons who were dealing in scrap during March, 1942—the freeze date of the general regulation—as competitive sellers of the same class. This is to allow them to apply the pricing formula in the regulation.

MISCELLANEOUS ORDERS

Allocation Order M-10 (Vinyl Polymers) was amended by WPB on April 21 to permit the use and acceptance of delivery of 50 pounds or less of vinyl polymers by any person in any calendar month. The amended order exempts from authorization the acceptance of, delivery or use of vinyl polymers for experimental purposes, as well as the delivery of vinyl polymer scrap to a producer or scrap dealer. The definition of vinyl polymers has been clarified to exempt acrylic resins as designated in M-260.

Use of ethyl cellulose except on specific authorization of WPB was restricted on May 6 with the issuance of General Preference Order M-175 as amended. The general 50 pound exemption for small orders is eliminated in the amended order and a general 10 pound exemption substituted. An exemption of 50 pounds in the case of acceptance or use for experimental purposes is, however, provided.

VAST POSTWAR RUBBER RESERVOIR BEING BUILT IN LATIN AMERICA

The Tropical Americas, now expanding rubber cultivation to new heights, will be in an enviable position in supplying crude rubber for manufactured rubber goods in the postwar period, according to Dr. E. W. Brandes, head pathologist in charge of rubber investigations of the Bureau of Plant Industry of the U. S. Department of Agriculture. Dr. Brandes recently returned from an extensive trip which took him through the rubber-producing areas of Mexico, Guatemala, Honduras, Costa Rica, Panama, Ecuador, and Peru. The Department of Agriculture is cooperating with the governments and with private industry in all of these countries to increase the production of rubber.

Dr. Brandes reported that he based his convictions partly on progress made by the Americas in combatting rubber plant diseases, one of the principal reasons for the decline of the crude rubber business in Latin America in years past. The South America leaf blight, he said, is being conquered by development of disease-resistant trees, these hardy trees, in turn, being crossed by hand pollination with high-yielding seedlings from the Far East to improve yields.

In Mexico, Dr. Brandes said, the remnants of two old Hevea plantations, one at El Palmar and the other at Las Palmas, are now in production. A large nursery for the production of superior high-yielding trees is in operation at El Palmar, and from one to two million trees will be prepared at this nursery for setting out on plantations all over Mexico. The nucleus for this expanded industry was supplied by Professor H. H. Bartlett, of the Department of Botany, University of Michigan, who, not long before Pearl Harbor, brought 175 packing cases, each containing 80 budded stumps, from the East Indies. Most of these were planted in Mexico, with some in Haiti and Honduras.

Referring to the battle against leaf blight, Dr. Brandes revealed that on one of the Ford plantations in Brazil a mil-

tion trees fell victim to the ravages of this disease. It was observed, however, that a few full, leafy canopies of healthy trees stood out sharply against the background of pest-ridden neighbors. This meant that the blight, carried from tree to tree by wind-blown spores, had not infected them. They were immune. Scientists then bud-grafted the immune tops to the other boles and produced a high-yielding, disease-resistant plant.

Some Special Developments

Special developments in the rubber situation in Latin America, which have come to attention in recent weeks, some of which are taken from the informal report rendered by Dr. Brandes on his return from his trip, follow:

Bolivia: A special technical service—the Servicio Cooperativo Interamerican de Salud Publica—has been created as an intermediate unit in cooperation between the government and the Institute of Inter-American Affairs. Bolivian health authorities, cooperating with public health workers of the United States, are setting up or operating health centers in six separate areas. A major activity is the combatting of malaria through elimination of breeding places of the mosquito which bears the disease.

Brazil: Another 10,000 tappers were expected to be enlisted and sent to Amazon rubber areas during the past month. A special arrangement with the Amazon Navigation Corp. has resulted in the use of at least seven steamers for migratory purposes. The landing of rubber workers in the rubber jungles by parachute was revealed as a hoax. To end the exploitation of rubber workers by traders located in Manaos and Para, stores to provide foodstuffs and other items are being set up by the government in conjunction with U. S. authorities. The stores will be financed by the Rubber Development Corp. and will sell at low prices on a non-profit basis.

Colombia: Three plantations are being developed as a result of cooperation between the Colombian Department of Agriculture, the Agricultural Credit Bank, and the Rubber Development Corp.

Ecuador: Arrangements have been made with the Ecuadoran Development Corporation to develop a 2,000-acre producing plantation at Quevedo. The land has already been selected and will be planted with special disease-resistant stock supplied by one of the several cooperative nurseries operated in the country.

Guatemala: At least 25 nurseries, operated in cooperation with private haciendas, are reported to be well under way. The coffee fincas in Guatemala are said to be eager to get away from their dependency on coffee and large scale rubber cultivation is anticipated as a result.

Mexico: In order to tighten government control over the rubber situation, a presidential decree has been issued giving the Rubber Importing, Distributing and Exporting Board a complete monopoly on rubber. In addition, the decree imposed a tax of $1.00 a pound on all rubber handled by private dealers. A recent shipment of 1,200 tons of rubber to the United States was reported. A scrap rubber drive has been launched.

Peru: Operations in the Madre de Dios region have been started by the Peruvian Amazon Corporation. Air transport is reported being used to move supplies into the remote jungle areas of this region, which is east of the high Andean ranges. Extensive stands of wild rubber trees are located in the region, but the same problems in transportation, food supply and control of malaria and other diseases exist. Plans for rubber cultivation in Peru also for setting out four plantations of 600 acres each.

GUAYULE

An investigation into the reasons behind the recent decree to cut guayule acreage in the United States, ordered some two months ago, may soon be made by the special Senate agricultural subcommittee, headed by Senator Gillette. The subcommittee has indicated that it may try to find out whether the decrease in guayule production was caused by the need of the land for food, as announced, or by the Administration's desire to prevent any kind of rubber industry from being firmly established in this country.

Necessity for securing large supplies of guayule was emphasized recently by William O'Neil, president of the General Tire & Rubber Co., in a letter addressed to Senator Gillette. Mr. O'Neil wrote: "The need for guayule is as great as it ever was, because the chemists still have found no way of eliminating the heat generated in a ten or twelve-ply tire. Natural rubber must be added to synthetic rubber to eliminate this heat-producing tendency, and guayule is our only promising source of natural rubber."

Large scale experiments conducted by private interests in the Salinas Valley of California have shown that the guayule shrub can and has produced natural rubber there at the rate of 1,000 pounds per acre in a single growing season, according to information furnished to Senator Gillette.

This high yield was obtained by broadcasting the guayule seed rather than growing it as a row crop. Growth of guayule by this technique eliminates the expensive practice of starting guayule plants in beds and later transplanting them to fields in rows for cultivation, the system used by the Agriculture Department in its experiments, Senator Gillette was told.

Fred J. Hart, secretary of the Monterey County Farm Bureau, Salinas, Calif., informed the Senator that the broadcast method of planting guayule would enable farmers to make enormous profits in rubber at 55c per pound, the price paid for Latin American rubber, and that farmers actually can make money by selling the guayule rubber at 10½c per pound.

Senator Gillette intimated that private production of guayule on a large scale is problematical, because the Government owns almost all the seed, and there is reason to believe little of it would reach the hands of private growers. Private interests now are trying to build up stocks of their own seed, but it might require several years to accumulate sufficient stocks for large-scale production, he added.

FREEZE PRICE OF TIRES AND TUBES BOUGHT BY GOVERNMENT AGENCIES

Prices for new rubber vehicle and airplane tires and tubes when bought by most Government agencies were frozen by OPA on May 1 with the issuance of Temporary Maximum Price Regulation 31 (Federal Government Purchases of New Tires and Tubes) and Amendments 5 to MPR 143 and 10 to RPS 63. The "freeze" will continue until new tire and tube ceiling prices on Government purchases are revised on the basis of the new prices for crude and synthetic rubber which went into effect on April 1.

The temporary price regulation establishes the present list prices of the Treasury's procurement division as maximum prices for Government purchases of new tires and tubes, except by the War and Navy Departments and the Defense Supplies Corp., purchases of the three latter agencies being price-controlled in other ways. It was emphasized that neither the new crude rubber prices nor the new regulations will affect prices for rubber products made for civilian consumption.

As a direct result of changes which OPA expects to make in regulations affecting sales to Government agencies of tires and tubes because of the change in raw rubber prices, the first formal industry advisory committee of tire and tube manufacturers has been organized. The new committee, called the Manufacturers' Tire and Tube Industry Advisory Committee, will centralize contacts between the industry and OPA as work proceeds to meet the probable deadline of June 1 for revisions.

The new advisory committee is headed by R. S. Wilson, vice-president, Goodyear Tire & Rubber Co., as chairman, and Earl McCreery, sales manager, Lee Tire & Rubber Corp., as secretary. Other members include the following: Paul A. Polson (Polson Rubber), Harry Webster (Denman Tire), Irving Eisbrouch (Dayton Rubber), Lee Jackson (Firestone), James J. Newman (Goodrich), Col. James L. Cochrun (Seiberling), Howard Hawkes (U. S. Rubber), L. A. McQueen (General Tire), J. A. Schaefer (Master Tire), and Paul Giblin (Armstrong Rubber).

Quotas for Month of May

The quota of new passenger car tires for May was set at 1,006,882 by OPA on April 28, which compares with 1,058,000 in April. The April quota was made up of 506,000 Grade I tires and 552,000 Grade II tires, but these grade distinctions were dropped on May 1 and all tires in both grades are now designated as Grade I. The quota of used and recapped casings, still designated as Grade III tires, is 600,799 for May against 598,000 for April.

The truck tire quota for May is 414,108, which compares with 368,000 in April. Since restrictions on the number of recapping certificates that may be issued have been removed, no quota for truck tire recapping was assigned for May.

Inner tube quotas for passenger cars for May amount to 735,781, against 736,000 for April, the figures for trucks being 434,355 and 338,100, respectively.

Final Result of Scrap Drive

Four checks, each of $608,296.30, totalling $2,433,185.20, were presented to the American Red Cross, Army Emergency Relief, Navy Relief Society, and the United Service Organization in Washington on May 5 by William R. Boyd, Jr., chairman of the Petroleum War Industry Council.

The checks represented proceeds of the scrap rubber drive conducted by the petroleum industry last summer as part of the nation-wide drive instituted by President Roosevelt. The nation's oil companies paid a penny a pound for rubber scrap brought to service stations and sold it to Rubber Reserve for a cent and a quarter a pound. The checks turned over to the relief organizations represented the difference between the two prices.

Subsequently, Jesse Jones, head of the Reconstruction Finance Corp., revealed that Rubber Reserve has purchased 867,000 tons of scrap rubber in all, of which 415,000 tons was supplied through the Petroleum Council. Of the grand total, he said, 440,000 tons have been sold and used in the manufacture of tires for civilians.

Amendments to Ration Order

Four additional amendments to Ration Order 1A (Tires, Tubes, Recapping and Camelback) have been issued by OPA since our last issue, as follows:

Amendment No. 24, issued April 13 and effective April 19, makes farm veterinarians eligible for replacement tires even when their casings are recappable. They may also secure two mud-and-snow tires besides their ordinary tires to make travel easier and safer in inclement weather.

Amendment No. 25, issued April 24 and effective May 1, makes passenger car drivers with mileage rations exceeding 240 monthly eligible for any grade of new tires when their present casings are not recappable. There is now no distinction between tires formerly categoried in Grades I and II. All new passenger car tires, those manufactured before Pearl Harbor, and the reclaimed tires made since, will all be designated Grade I.

Amendment No. 26, issued April 23 and effective May 7, removes quota restrictions on the number of certificates for truck tire recapping that may be issued monthly by local rationing boards to eligible vehicle operators. It also withdraws the rule that certificates for recappings or inner tubes can be issued for List B trucks only after the 25th day of the month, and provides that these certificates may be granted at any time at the discretion of the boards.

Amendment No. 27, issued April 26 and effective May 1, provides that rationing certificates for replacement tires on farm tractors can be issued in areas where facilities for recapping the casings already on the vehicle are inadequate.

Lift Used Equipment Control

All controls over the distribution of used tire retreading, recapping and repair equipment were lifted by WPB on April 29 with the issuance of General Limitation Order L-61, as Amended April 29, 1943. In addition, the production and acquisition of new tire retreading, recapping and repair equipment having a retail value of $85 or less is now permitted.

The original order permitted production and acquisition of tube repair or spot equipment having a retail value of $100 or less. This provision has now been broadened to include all items of new retreading, recapping or repair equipment, except curing heads and matrices.

Other changes which have been made in the latest amended order are without substantive effect, with the exception of the change in the form now necessary. All applications under the new order must be made on Form PD-840.

Miscellaneous Tire News

Also of interest to the overall tire industry during the past month were the following developments:

Commercial Standard for Treading Automobile and Truck Tires (CS 108-43), a recorded standard for this industry, effective for new production from June 10, 1943, has been issued by the National Bureau of Standards, Washington, D. C. Copies are available on request to the Bureau.

As the result of efforts by the Smaller War Plants Corp. in conjunction with the procurement division of the Treasury and representatives of the industry, 500 small tire recappers throughout the nation will be put to work on contracts under the General Schedule of Supplies let by the Procurement Division, it was announced on May 3.

A 60-day test of tire tread wear on over-the-road trucks, part of an analysis of the effect of the 35-mile speed limit on rubber-borne transportation, was started by the Office of Defense Transportation on April 29. Standards for the test were developed by representatives of the ODT, Bureau of Standards, Office of the Rubber Director, Public Roads Administration, and the Rubber Manufacturers Association.

In a special announcement on May 12, OPA made it clear that an eligible truck operator who is unable to get rationing certificates for new tires because his local rationing board has exhausted its quota can obtain certificates for used tires instead.

On April 19 Edward R. Stettinius, Jr., Lend-Lease Administrator, revealed that in the first four months since the Allies landed in North Africa, food, clothing, medicines and other necessities of life, having a dollar value of $26,250,000, were shipped to North Africa from the United States under Lend-Lease. Of this amount, $405,000 represented tires and tubes.

Long Conveyor Belt

One of the nine long conveyor belts built by the Goodyear Tire & Rubber Co., Akron, to provide impervious clay from a borrow pit nearly two miles away for the core of the giant Anderson Ranch dam in the south fork of the Boise River, is pictured above. The dam, 70 miles from Boise, Idaho, will be the highest earthen dam in the world.

Fire at Cats Paw Plant

A six-alarm fire swept through the warehouse and packing rooms of the Cats Paw Rubber Co. in Baltimore on April 16, causing severe damage and sending dense clouds of smoke through near-by industrial plants before it was brought under control. Fire also damaged one of the two chemical buildings operated by the M. A. Knight Co., in Akron, on April 21. The latter company makes chemical stoneware and also handles the sale of rubber drums for General Tire.

SYNTHETIC RUBBER DISCUSSED BEFORE CHICAGO RUBBER GROUP

Synthetic rubber was the theme of a meeting of the Chicago Group, Rubber Division, A.C.S., held in the Mural Room of the Morrison Hotel in Chicago, Ill., on April 30. The speaker of the evening was Dr. H. A. Winkelmann, technical director of the Dryden Rubber Co., who spoke on "A Comparison of the Synthetic Rubbers."

Dr. Winkelmann spoke of our present synthetic rubbers as "expediences" for the duration of the war, but predicted that after the war, rubber technologists would have far superior types with which to work and types which would require far different methods of handling than those which are now in use. He cautioned the rubber technologists to keep an "open mind" on the subject of natural rubbers and the synthetics, so that they might more easily accept and utilize the new types which are being, and will be, developed in the near future.

Dr. Winkelmann then drew a general comparison of our present types, namely, natural rubber, GR-S, Perbunan and Hycar OR, the neoprenes, Butyl rubber and the Thiokols. This comparison was illustrated by slides and showed the advantages and limitations of each of these particular types.

After his talk, Dr. Winkelmann acted as Master of Ceremonies for a "question and answer" session. The board of experts was made up of Dr. C. S. Yoran (Wishnick-Tumpeer, Inc.), Chairman of the Chicago Rubber Group; B. W. Hubbard (Ideal Roller & Manufacturing Co.), Secretary-Treasurer; W. F. Bernstein (Victor Manufacturing & Gasket), H. Boxser (Western Felt Works), F. Frost (Frost Rubber Co.), J. Kirschner (Dryden Rubber Co.), and A. H. Voss (Western Electric Co.). This group answered questions pertaining to the synthetics which had been submitted by the membership.

Luncheon Meeting Held

A joint luncheon, substituting for the usual International Meeting because of the clash of dates, was held by the Buffalo Group, Rubber Division, A.C.S., and the Ontario Rubber Section, Canadian Chemical Association, at the Book-Cadillac Hotel in Detroit on April 16 during the two-day meeting of the Division of Rubber Chemistry, A.C.S. Approximately 75 members and guests of the two groups attended the luncheon, which was marked by good fellowship and stimulating table conversations. Dr. Per K. Frolich, director of the chemical division, Esso Laboratories, Standard Oil Co. of New Jersey, and president of the American Chemical Society, delivered a short address on the importance of cooperation between American and Canadian chemists, inserting several personal anecdotes in his talk. He urged continued cooperation between the two countries in the post-war period.

Coming Events

May 27. Buffalo Rubber Group, Hotel Touraine, Buffalo, N. Y.

June 1. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Calif.

June 4. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

June 11. New York Rubber Group, Building Trades Club, N. Y. City.

June 25. Boston Rubber Group, Annual Outing, Commonwealth Country Club, Boston, Mass.

June 28-July 2. Annual Meeting, A.S.T.M., Wm. Penn Hotel, Pittsburgh, Penna.

Sept. 6-10. American Chemical Society, 106th Meeting, Minneapolis, Minn.

Oct. 5-7. National Safety Council, Sherman, LaSalle and Morrison Hotels, Chicago, Ill.

Dec. 6-11. 19th Exposition of Chemical Industries, Madison Square Garden, New York City.

New York Meets on June 11

The next meeting of the New York Group, Rubber Division, A.C.S., substituting for the usual summer outing, will be held on Friday, June 11, at the Building Trades Club, 2 Park Avenue, New York City. Joseph Breckley, technical representative of the Titanium Pigment Corp., will speak on "Some Observations on Flex-Cracking of Buna S." In addition a representative of the Sherwin-Williams Co. will talk on Kempol and one from Stanco Distributors will discuss Butyl Rubber. As usual, the meeting will start promptly at 4:30 P.M. and dinner will be served at 6:30 P.M. Light entertainment will be furnished during and after dinner. Reservations for the meeting should be made as soon as possible with the secretary-treasurer of the group, B. B. Wilson, c/o *India Rubber World*, 386 Fourth Ave., New York City.

Buffalo to Hear Dr. Furnas

Dr. C. C. Furnas, director of research for the Curtiss-Wright Corporation, and author of the widely-discussed article "And Sudden Death," will be the principal speaker at the next meeting of the Buffalo Group, Rubber Division, A.C.S., to be held on Thursday, May 27, at the Hotel Touraine, in Buffalo, N. Y. Dr. Furnas, who was formerly head of the chemical engineering department of Yale University, will talk on "The Next Twenty-Five Years." Tickets for the meeting, at $1.65 each, can be secured from the secretary-treasurer of the group, Norman J. Cyphers, c/o Hewitt Rubber Corp., Buffalo, N. Y.

19TH CHEMICAL EXPOSITION TO BE HELD DECEMBER 6-11

Dates for the 19th Exposition of Chemical Industries, under the usual sponsorship of the International Exposition Co., 480 Lexington Ave., New York City, have been definitely set for the week of December 6th to 11th, 1943. According to Charles F. Roth, popular manager of the Exposition, 90% of the companies responding to a recent survey indicated their enthusiasm for the holding of the event this year. These chemical expositions, held biennially, date back to 1915.

This year Madison Square Garden will be the scene of the event instead of Grand Central Palace. The change results from the fact that the U. S. Army has commandeered the exposition floors of the Palace as an induction center. Following a survey of various building facilities it was found that the Garden is the only building available in New York City suitable for the needs of the Exposition.

All exhibition space will be on one huge floor. However, the actual amount of space available will be approximately one-half of that of the 1941 Exposition which was held in the Palace. Sizes will vary from 22 x 14 feet to 8 x 11 feet. As now planned there will be a few booths of larger size available.

Industrial exhibitions of the character of the Chemical Exposition have proven most helpful in the war effort in many ways. As in peace time, it brings about an interchange of ideas and solves many problems. Exhibitors welcome it as an aid in post-war selling and distribution of their products which will be available when their war efforts have terminated. Then, too, the contacts made through the Exposition are invaluable to exhibitors. Getting more from present equipment through efficiency and making it last longer will be factors in the Exposition program.

Additional "E" Awards Made

The Los Angeles, Calif., plant of the B. F. Goodrich Co., and the firm of John Royle & Sons, Paterson, N. J., were included among companies receiving the Army-Navy "E" award for production efficiency in recent weeks. The Goodrich citation was the first to be made to a rubber company on the Pacific Coast and was the seventh production award won by the company.

Furnace Black Plant Started

The new furnace carbon black plant of Godfrey L. Cabot, Inc., located near Guymon, Oklahoma, started operations last month. Sterling Brand black will be produced at the new plant. A second large plant, near Ville Platte, Louisiana, is now under construction, according to an announcement from the Boston headquarters of the company.

RECORD ATTENDANCE SET AT RUBBER DIVISION'S DETROIT MEETING FEATURED BY PRESENTATION OF GOODYEAR LECTURE AND 18 PAPERS

An all-time attendance record for meetings of the Division of Rubber Chemistry, A.C.S., was set at the meeting held in Detroit, Mich., on April 15 and 16, in conjunction with the 105th Meeting of the parent society. Approximately 600 members and guests attended the first technical session, held on Thursday morning, April 15, and more than 1100 were in attendance at the opening of the second session, held on Thursday afternoon, which featured the presentation of the Charles Goodyear Lecture.

Headquarters for the Division were maintained in the Book-Cadillac Hotel, but all technical sessions were held in the Masonic Temple. Although the first session was held in a room on the third floor of the Temple, all subsequent sessions were held in the Crystal Room in the basement to accommodate the overflow crowd.

In addition to the Goodyear Lecture, the meeting featured the presentation of 18 technical papers, a report from the Crude Rubber Committee, the business session, nomination of candidates for offices next year, and the perennial banquet. Although 20 technical papers were scheduled, two were withdrawn, these being "Agripol, A New Chemurgic Rubber Substitute," by Andrew J. Snyder and Clinton A. Braidwood (Reichhold Chemicals, Inc., Detroit, Mich.), and "Effect of Time and Temperature of Cure on Properties of GR-S Tread Stocks," by B. S. Garvey, Jr., and A. E. Juve (B. F. Goodrich Co., Akron, Ohio). Abstracts of all of the papers presented, including the two withdrawn, appeared in the March, 1943, issue of RUBBER AGE.

Sebrell is Goodyear Lecturer

The Goodyear Lecture was delivered by Dr. L. B. Sebrell, director of the research department of the Goodyear Tire & Rubber Co. Although Dr. Sebrell was the second Goodyear Lecturer selected by the special committee of the Rubber Division, his lecture was the first ever actually presented. The first Lecturer selected was Dr. David Spence, of California, but illness prevented him from presenting a lecture in 1942. Dr. Sebrell was originally scheduled to deliver his lecture last September at the Buffalo meeting, but it was withdrawn prior to that meeting due to censorship difficulties.

The Second Goodyear Lecturer is a native of Alliance, Ohio, was graduated from Mt. Union College, and started with Goodyear in September of 1919 after previous experience with the Chemical Warfare Service of the U. S. Army, in Washington, and as an instructor in chemistry at the Case School of Applied Science in Cleveland. Prior to the delivery of the lecture by Dr. Sebrell, J. T. Blake (Simplex Wire & Cable), chairman of the Division, reviewed the steps leading up to the decision to name a Goodyear Lecturer each year, and A. R. Kemp (Bell Telephone Labs.) briefly reviewed some of Dr. Sebrell's past work, especially in connection with the development of mercaptobenzothiazole.

Taking as his subject, "The Second Mile," Dr. Sebrell, in his lecture, discussed the current status of synthetic rubber from the technical standpoint. He reviewed many tests which had been made to provide comparison between the synthetic and natural products, many of which disclose that one type or another of synthetic rubber is superior to natural rubber for certain specific purposes. Referring to tensile tests, he said that "it is well-known that in pure gum stocks the tensile strength of the butadiene copolymers is not as good as that of natural rubber, while that of butyl rubber does not compare too unfavorably."

Other points brought out by Dr. Sebrell included the following: (1) Natural rubber has the highest resilience of any of the rubbers although the synthetics show more improvement in resilience as temperatures are increased than does natural rubber; (2) All synthetic rubbers are more resistant to abrasion than are similar compounds prepared from natural rubber; (3) Natural rubber is much more easily plasticized by milling than the synthetics, the increase in plasticity as a result of between 1 and 10 trips through the mill being very marked for natural rubber, a much smaller increase is shown by synthetic rubber in the same number of millings; (4) Natural rubber is less resistant to oxidation than is butyl, while the buna types are superior in the entire group in this respect. Dr. Sebrell spoke for about an hour and a half, and presented some 60 slides.

The Charles Goodyear Lecturer is selected by a committee composed of seven past chairmen of the Rubber Division. Although the by-laws provide for the presentation of a commemorative plaque, as well as a cash award, the shortage of metal has resulted in the substitution of scrolls for the duration. Dr. Sebrell was presented with a scroll at Detroit and will receive a plaque after the war.

Crude Rubber Committee Report

The report of the Crude Rubber Committee was presented on Friday, April 16. It was given by George A. Sackett, chairman, who was formerly with the Goodyear Tire & Rubber Co. in a research capacity and who is now with the Faultless Rubber Co., Ashland, Ohio, as director of that company's chemical division. The full report follows:

The activity of the Crude Rubber Committee has been very greatly decreased. The problems which all of us faced after Pearl Harbor made the matter of quality study of crude rubber of relatively little importance. As a result the committee, although it has continued to exist in name during the past year, has had only one meeting and did not make an official report at Buffalo last fall.

Dr. L. B. Sebrell
the Second Goodyear Lecturer

There has been some discussion as to how the Crude Rubber Committee could best serve under present conditions. The use of wild rubber, synthetics and substitute materials presents a great task in industrial adaptation, and the question has been raised as to whether or not the committee can be of assistance.

The Crude Rubber Committee is and has always been ready to do its share, but it must be remembered that each member is engaged in industry needed in the war, and that also the members are not geographically near one another, so that meetings and discussions require time for travel in addition to time spent in discussion and the time factor is important.

The increased availability of wild rubbers has made it seem desirable to have a standard method of evaluation worked out for such materials. Wild rubbers, however, are obtained from a wide variety of sources, and so will vary greatly in the properties of the crude material as well as in the quality of the vulcanized rubber obtained. Each source must be studied for availability and use, and so each material becomes a subject of investigation. Generally speaking, the crude material must be tested for moisture and foreign material and the amount of vulcanizable hydrocarbon present, and then the method of getting the greatest value out of it has to be learned.

It is probably true in the case of most wild rubbers, and in this discussion the Hevea types are excepted because they are similar to the plantation rubber in their general properties, that they will be used in blends with Hevea rubber. The best way to adapt these to use is for each industrial company to study the use of these rubbers in their own product and using their own equipment. When some of these non-Hevea rubbers are available

in quantity, their general properties should be evaluated and this information given to the industry.

The Crude Rubber Committee is willing to assist in the evaluation of the various types of rubber, but it cannot undertake the examination of individual samples of rubber. Such examinations would require a very great deal of time, and it is properly not the function of the Committee to consider materials other than those available in large quantity so that the whole industry can use them.

Substitute materials are becoming of increasing importance. By this term is meant the non-rubber hydrocarbon type of polymer which is being adapted to special products and uses. They are important but here we face specialized uses which are not of concern to the rubber industry at large except that all technologists are greatly interested in adapting them to their own products when and where this is possible.

The various synthetic rubbers have been and are being studied very actively by all rubber technologists. The proposal has been made that the Crude Rubber Committee study the development of tests for the various synthetics to develop a standard method of evaluation. It is not wise to do this at this time. Those materials made by private industry are being studied to provide the widest use and these studies are still in the hands of the companies responsible for their production.

A general scheme of classification has been worked out by a joint committee of SAE and ASTM and published in the June, 1942, *SAE Journal*. It is an excellent start in this direction and probably can be carried further. This was done, however, to simplify specifications for an industry and not to develop control properties of the raw material.

The manufacture of GR-S is being very carefully studied by technologists in the manufacturing plants and in the consumer plants as well. It is probably better to continue this method than to try to develop a parallel program in the Crude Rubber Committee.

The Crude Rubber Committee was established to develop tests of quality of rubber. It does not seem necessary that a departure be made from this purpose at this time, and it also seems that until certain materials are stabilized in method of production and increased in availability so that they are readily used, that the committee needs to function on these new materials.

The committee would like to have comment or criticism from the Division members on this report and to know whether others have ideas which would be practical under present conditions so that the committee can be useful to the Division. (End of Report).

Nominations are Presented

At a short business session, held on Thursday afternoon, Dr. Blake announced that the Rubber Division will definitely hold a Fall Meeting this year, although no decision has yet been made by the Executive Committee as to the location of the meeting. A. R. Kemp, representing the Nominating Committee in the absence of its chairman, John Street (Firestone), presented the following nominees for the 1943-44 offices:

Chairman, Harold Gray (Goodrich); *Vice-Chairman,* F. H. Amon (Cabot), W. A. Gibbons (U. S. Rubber), W. W. Vogt (Goodyear); *Secretary,* H. I. Cramer (Sharples Chemicals); *Treasurer,* C. W. Christensen (Monsanto); *Sergeant-at-Arms,* Bruce Silver (N. J. Zinc), M. J. DeFrance (Goodyear); *Directors,* George Haslam (N. J. Zinc), A. H. Nellen (Lee Tire), N. G. Shepard (American Cyanamid), R. F. Dunbrook (Firestone), F. W. Frerichs (Cupples), J. H. Osterhof (Goodyear), J. H. Doering (Ford). As usual, election will be held by letter ballot. Three new directors are to be named.

Banquet Attracts 750 Guests

Approximately 750 members and guests attended the banquet, which was held on Thursday evening, April 15, at the Book-Cadillac Hotel. C. F. "Boss" Kettering, head of the General Motors research division, was the principal speaker. Mr. Kettering discussed the "Importance of Research to the Rubber Industry," during which he told anecdote after anecdote, interspersing his serious remarks with good humor. His talk was very well received and he was given a long ovation.

An exceptionally fine program of entertainment, featuring a male quartet, was presented, in addition to which an orchestra, with a female soloist, played throughout dinner. The arrangements for the banquet were in the hands of J. H. Doering (Ford), who merits the thanks of the Division for a job well done.

Rubber Cement Substitutes

The Seaboard Seatex Corporation, 611 Broadway, New York City, has developed a full line of rubber cement and latex substitutes, some of which are said to replace adhesives which contain as much as four pounds of rubber to the gallon. Unlike most other synthetic adhesives, these substitute cements are reported to have rub-off qualities very similar to rubber cement and latex. Synthetic Seatex, which is similar to latex, and Seatest Rub-Sub Cement, which is similar to rubber cement, contain no crude or reclaimed rubber of any kind, both drying transparent, flexible and clean. Sea-Rub Cement, which is suitable for any operation in place of crude rubber cement, is made from reclaimed or scrap rubber, while Reclaim Seatex Cement, which can replace latex for most shoe operations, is made from reclaimed rubber. All of the substitutes developed by the company are said to have most of the characteristics of rubber adhesives. They have found wide application in the shoe field.

SEIBERLING RUBBER OFFICIALS RECEIVING ARMY-NAVY "E" AWARD

As reported in our last issue, the Army-Navy "E" production award for "great accomplishment" was recently given to the Seiberling Rubber Co., Akron, Ohio. In the above reproduction, A. A. Leedy, factory superintendent (left); H. P. Schrank, vice-president in charge of production (center); and G. T. Palmer, co-chairman of the company's labor-management committee (right), display the award flag after the official Army presentation on April 7.

NAMES IN THE NEWS

HARVEY S. FIRESTONE, JR., president of the Firestone Tire & Rubber Co., has been elected a charter trustee of Princeton University to serve until the retirement age of 70. This is the highest honor Princeton can bestow on one of its graduates. MR. FIRESTONE is a member of the Class of '29.

WALTER P. VOTH, president and general manager of the Akron Standard Mold Co., has been elected vice-president of both the Lectromelt Steel Casting Co. and the Barberton Foundry Co., both of which in normal times produce castings for the rubber and steel industries. Both of these concerns were founded by the late A. J. FLEITER.

GERALD S. WILSON, purchasing agent of the Wilson Rubber Co., was elected vice-president of the Canton (Ohio) Rotary Club last month.

RALPH HANES, associated with the U. S. Rubber Co. for the past 15 years, has been made manager of sales promotion of the Mechanical Goods Division of that company.

FREDERICK W. BIERWIRTH, vice-president and telephone sales manager of the Western Electric Co., was elected a director of that company on April 13. He has been with the company since 1912, acting as works manager of the Kearny, N. J., plant from 1935 to 1939.

A. O. BLADES, formerly connected with the Rome, N. Y., plant of the General Cable Corp., is now associated with the Rome Cable Corp., Rome, N. Y., where his specialty is the application of synthetic rubber and resins to wire and cable.

WARREN H. JONES, formerly connected with the General Cable Corp., and more recently superintendent of the rubber department of the DeVilbiss Co., Toledo, Ohio, has joined the research laboratories of the Owens-Corning Fibre Glass Corp., Newark, Ohio, where he is engaged in the service application of glass to rubber.

G. OGDEN TRENCHARD, until recently senior economist in the Office of the Rubber Director at Washington, was recently appointed manager of the business research department of the Firestone Tire & Rubber Co., Akron.

C. A. DAMEN, who has served with the Army Medical Corps since last September, has been honorably discharged because of the new age ruling and has resumed his representation of the New England area for Wishnick-Tumpeer, Inc. He will also cover some of the New York accounts.

FRANK C. LESLIE, Legal counsel of the B. F. Goodrich Co. since 1928, has resigned from the company to join the legal staff of the Coca-Cola Co. in Atlanta, Georgia.

JOHN WOLCOTT HADDOCK, formerly vice-president of the Sullivan Machinery Co., of Claremont, N. H., and Michigan City, Ind., has been elected president of the Farrel-Birmingham Co., Inc., of Ansonia, Conn. He assumed his new duties on May 1.

DR. WILLARD HENRY DOW, president of the Dow Chemical Co., Midland, Mich., has been selected as the Chandler Lecturer and Medalist for 1943 by Columbia University. The citation accompanying the award referred specifically to the company's achievements in producing synthetic rubber and resins.

HENRY F. SCHIPPEL, one of the better known tire engineers in this country, has returned to the B. F. Goodrich Company's Akron headquarters after spending almost a year in Africa where he was project engineer in charge of rubber products at two large American repair and maintenance bases. He has been assigned to special engineering duties with the Goodrich aeronautical division.

EARL L. MEFFORD, associated with the Goodyear Tire & Rubber Co. in various sales capacities since 1917, more recently serving as manager of the New York district, has been made head of the company's office in Washington, D. C., with the title of assistant to the vice-president. The appointment is designed to coordinate the company's expanding and varied governmental activities.

HERBERT E. SMITH, president of the U. S. Rubber Co., has accepted the chairmanship of the Manhattan Rubber Division of the Greater New York Fund campaign. This is an annual appeal on behalf of 406 voluntary hospitals, health and welfare agencies.

JOHN L. COLLYER, president of the B. F. Goodrich Co., has been named chairman of the Akron district of the Committee for Economic Development. The committee is an independent, private, nonprofit corporation set up to stimulate post-war planning.

CHESTER J. NOONAN, manager of clothing, coated fabrics and Koyalon at the Mishawaka, Ind., plant of the U. S. Rubber Co. since 1938, has been appointed general sales manager of the company's footwear division. Before going to Mishawaka, he was manager of footwear sales for the company's Pacific Coast Division.

BURTON F. STAUFFER, assistant general manager of the industrial products sales division of the B. F. Goodrich Co., Akron, celebrated his 50th anniversary with that company last month. He was honored at a luncheon of company executives and received numerous gifts.

N. G. MADGE, for many years department manager of the General Laboratories of the U. S. Rubber Co., at Passaic, N. J., is now associated with the Synthetic Rubber Division of the company, and is stationed at Institute, West Virginia.

DR. THOMAS MIDGLEY, vice-president of the Ethyl Gasoline Corp., and widely known for his work in rubber chemistry, was re-elected chairman of the American Chemical Society at the Detroit meeting last month. As he is also president-elect of the Society, he becomes the first in the history of the Society to hold both offices at the same time.

WALTER LEE, who joined the Goodyear Tire & Rubber Co. as night superintendent of the Los Angeles plant in 1922, has been appointed resident chief engineer in Detroit for the company. He will coordinate all engineering activities between Goodyear engineers and the Army Ordnance Department.

J. ARTHUR MINCH, general manager of the wire division of the Electric Auto-Lite Co., Port Huron, Mich., was recently elected one of five new vice-presidents. He joined Auto-Lite in 1914, was appointed vice-president of the company's Canadian subsidiary in 1934, and became manager of the wire division in the same year.

ROBERT REID, vice-president of the R & J Dick Co., Clifton, N. J., has been elected president of that company to succeed the late BENJAMIN KEILEY. He has been with the company since joining it as an office boy in 1917. WILLIAM M. BARCLAY, who retired several years ago as vice-president, has returned to that position.

DR. F. L. KILBOURNE, director of research of the Xylos Rubber Co., Akron, passed the cigars last month, the occasion being the birth of a son to MRS. KILBOURNE at People's Hospital in Akron.

Washington Appointments

P. H. WATKINS, technical director of the Eagle Rubber Co., Ashland, Ohio, has joined the Office of the Rubber Director. He will act as chief industrial specialist under R. P. Dinsmore.

WALTER H. ZARTMAN, until recently employed at DuPont's Wabash River Ordnance Works, has joined the Rubber Reserve Co.

SIDNELL-KRANTZ-BALLARD HEAD AKRON RUBBER GROUP

The election of officers for the 1943-44 season, which featured the annual Spring meeting of the Akron Group, Rubber Division, A.C.S., held at the City Club in Akron, Ohio, on April 30, with about

A. E. Sidnell
heads Akron Rubber Group

150 members and guests in attendance, resulted in the following: *Chairman*, A. E. Sidnell (Seiberling Latex Products Co.); *Vice-Chairman*, W. J. Krantz (Goodyear Tire & Rubber Co.); *Secretary-Treasurer*, E. W. Ballard (Midwest Rubber Reclaiming Co.). Action on the usual summer outing was taken and it was voted to postpone this occasion for the duration.

A. C. Horrocks, the principal speaker at the meeting, delivered an address on "The New America." He discussed the future facing this country after the soldiers and sailors return to civilian life. These men, he said, have been great sales promoters; they will have established new trade routes, because war routes are trade routes; they will have had up to $28,000 expended on their education; and they will come back ready to build and improve and make the United States a still greater nation.

In addition to entertainment furnished during the cocktail hour and dinner hour by Marion Miller's All-Girl Orchestra, including special dancing numbers by talented members of the orchestra, a special and unusually entertaining program was presented by H. Walter Grote, of the United Carbon Co. Dr. Grote, whose feats of legerdemaine rank with those of the professionals, was in fine fettle and his tricks were enthusiastically received. His explanation of the tricks were sometimes more mystifying than the tricks themselves.

A handy wall chart furnishing detailed instructions as to how to get extra life and efficiency from electrical wires and cables has been made available by the Okonite Co., Passaic, N. J.

Yohe Named Plant Manager

Dr. Robert V. Yohe, technical superintendent, chemical division, B. F. Goodrich Co., Akron, has been named plant manager of the government synthetic rubber plant operated by Goodrich in Louisville. He succeeds J. W. Frasche, who has been named plant manager of a similar plant to be operated by the company in Texas, and is succeeded in turn at Akron by Dr. Frank K. Schoenfeld, who has been in charge of the Koroseal research and development laboratories for the past few years. Dr. Yohe has been associated in various research capacities with Goodrich since 1931. In recent months he has acted as chairman of the manpower committee established by the Office of the Rubber Director to determine the extent of manpower needed to operate the plants in the government's overall synthetic rubber program.

Staytex Adhesives

Two different adhesives, one fast drying and the other slow drying, both easy to spray, and both applicable in many operations as a direct substitute for rubber or latex adhesives, have been developed by the Staytex Corporation, 152 West 27th St., New York City. Derived from a casein base, these Staytex adhesives have been found especially well suited for use in the combining of various materials. When used as combining agents, the finished materials can be dry cleaned with safety, since the typical benzene solvent or carbon tetrachloride has no effect on the adhesives. This is particularly important where furs, leather, and similar materials are concerned. Staytex adhesives are said to be completely odorless when sprayed and develop no odor in service.

Issue Bulletin on Crude Rubber

A summary of published data on crude rubber, prepared as background information for the use of writers looking for material on the subject, has been prepared and issued by the Rubber Manufacturers Association, 444 Madison Ave., New York City. The summary is quite conclusive, running to 54 pages, and covers historical notes, early rubber supply, plantation rubber, prices, stocks, and statistics. Several charts and maps are included. This is the fourth summary issued by the Association, previous ones being devoted to guayule, scrap and reclaimed rubber, and synthetic rubber.

Move Research Laboratories

The General Cable Corporation recently transferred its rubber research activities from the Rome, N. Y., to the Bayonne, N. J., plant. Included in the staff at Bayonne, which operates under the direction of Dr. R. A. Schatzel, director of research, are J. E. Waters, R. F. Tefft, Robert Graham, and R. L. Dickerson.

NORTHERN CALIFORNIA GROUP HEARS TALK ON HYCAR RUBBER

The regular monthly meeting of the Northern California Rubber Group was held on April 29 in the Spanish Room of the Claremont Hotel in Berkeley, California. Approximately 60 members and guests were in attendance.

W. D. Parrish, of the Hycar Chemica. Co., was the principal speaker. Discussing "Hycar Synthetic Rubber," Mr. Parrish first outlined the development of synthetic rubber from its early stages to the present stage, and then launched into an extensive description of the various Hycar rubbers, including OS-10, OS-15 and OS-25. Although he did not have the use of slides, Mr. Parrish's talk was clear and stimulating and resulted in a lively question-and-answer period.

A door prize, consisting of a $25 War Bond, donated by the Hycar Chemical Co., was won by Douglas Anderson of the Shell Development Co. Table favors, consisting of leather cases for gasoline ration books, were donated by the C. P. Hall Co., through Bob Abbott. Before dinner was served, George Petelin, compounder of the Goodyear Rubber Co. of San Francisco, entertained by talking to the crowd in Chinese, after which he gave an interesting explanation of the Chinese language and its symbols.

Montreal Group Holds Meeting

A meeting of the Rubber and Plastics Division of the Montreal Section of the Society of Chemical Industry was held at the Faculty Club in Montreal, Canada, on April 9. Approximately 55 members and guests were in attendance. H. K. Nason, assistant director of research, Monsanto Chemical Co., Springfield, Mass., spoke on "Developments in the Functional Utilization of Plastics." During his talk, Mr. Nason presented numerous slides showing the advances made in the past two years in accumulating comparative physical data for plastics and light metals used in aircraft structures. At the business session, it was stated that the membership of the group now totaled 93, an increase of 25% over last year. In keeping with the policy of the group 11 members were elected to the new Executive Committee, as follows: H. L. Blachford, Henry Chauvin, John Dunn, W. P. B. Gedye, R. S. Jane, Wilfred Jonah, A. B. Lewis, J. H. McCready, L. C. McLeod, J. R. Mills, and E. W. Thorne. Officers will be selected later at a joint meeting of the retiring and incoming executive committees.

Acquire Thomson-Judd Wire Co.

The National Wire Machinery Co., manufacturers of a complete line of wire stranding and insulating machinery, as well as auxiliary equipment, has purchased the Thomson-Judd Wire Machinery Co., and is now located at its new plant at 821 Washington Street in Lynn, Mass. A. R. Petterson is president of the National Wire concern.

NEWS IN BRIEF

U. S. Rubber Co. has undertaken the sponsorship of a 52-week series of regular Sunday afternoon concerts by the century-old New York Philharmonic-Symphony. The series will be broadcast over the full network of the Columbia Broadcasting System.

Airfoam products, no longer useful for their original purposes, are being converted into protective paddings for the gunwales of U. S. Navy personnel boats which service seaplanes while the latter are at anchor, according to H. D. Herbert, manager of the Airfoam Department of the Goodyear Tire & Rubber Co., Akron.

Reprints of the article, "Galex as a Plasticizer for GR-S (Buna S) Stocks," by Julian Panek, which appeared in the April, 1943, issue of RUBBER AGE, have been made available by the Thiokol Corp., Trenton, N. J. Copies are available on request to the company.

Standard Oil Co. of Indiana has adopted the Schrader comparative air loss test for tires. This test, designed to help conserve rubber for the American war effort, was publicized by Schrader several months ago, at which time a description of it was published in this journal.

A sponge rubber gasket covered with a smooth coating of Ameripol via the extrusion method was recently announced by Goodrich. Currently used for military products, the new gasket is expected to find wide application in the refrigerator, automotive and other industries in the postwar period.

An improved double cone blender, which incorporates a device within the cone which prevents any two particles of material following the same path and breaks up agglomerates, has been patented by the H. K. Porter Co., Inc., Pittsburgh, manufacturers of process equipment.

Spray-Dip Rubber Corp., which is managed by the J. M. Cranz Co., Inc., has moved its factory and offices to 2671 Main St., Buffalo, N. Y. Increased manufacturing facilities are provided in the new quarters.

To help companies break in women drivers for all types of industrial trucks, the Elwell-Parker Electric Co., Cleveland, has prepared an easy-to-understand book of instructions under the title, "Lady, Will You Give a Lift?" Copies are free on request to the company.

Control of the McAlear Manufacturing Co., Chicago, producer of valves, regulating and control equipment, has been acquired by the interests controlling the Climax Engineering Co., Clinton, Iowa. The latter concern manufactures internal combustion engines, power units and generating sets.

N. J. Zinc Co., 160 Front St., New York City, has prepared a brochure reprinting three of its recent advertisements devoted to technical data on the incorporation of zinc oxide in reclaim stocks. Copies of the brochure are available on request to R. M. Neumann, general sales manager.

Approximately 30,000 feet of conveyor belts, supplied by Goodyear, are in use at the giant Anderson Ranch Dam in the south fork of the Boise River, 70 miles from Boise, Idaho. The belts will handle most of the 12,000,000 cubic yards of clay and other types of soil needed in the construction of the dam, the highest earthen dam in the world.

Featuring the theme, "Use the Air You Need but Don't Waste It," a new series of industrial posters, designed to wage war on leaky hose couplings, valves and other pipe fittings, has been made available by the Ingersoll-Rand Co., 11 Broadway, New York City. Copies can be secured without cost on request to the company.

The "Handbook of Emergency War Agencies," a guide to Federal agencies all of whose present functions are devoted to the prosecution of the war, which includes organizational outlines and the names and addresses of officials of these agencies, the War and Navy Departments,, and the U. S. Maritime Commission, has been issued by the Office of War Information. Copies are available from the Superintendent of Documents, Washington, D. C., for 20c each.

Two booklets on combatting absenteeism in factories have made their appearance. One is called "Ways of Dealing with Absenteeism" and has been issued by WPB's War Production Drive Headquarters for the guidance of its labor-management plant committees. The other is "Controlling Absenteeism", which sets forth the experiences of management in some 200 war plants, released by the Division of Labor Standards, U. S. Department of Labor, Washington, D. C.

Penalize Russell Sales Co.

The Russell Sales & Manufacturing Co., which maintains an office in New York City and makes fly-catching devices at Hudson, N. Y., has been denied priorities assistance and allocation of all material governed by WPB for a six-month period for violating General Preference Order M-15 and Supplementary Order M-15-b. The devices made by the company are coated with a gummy adhesive in the making of which a small percentage of rubber in solution is used. The penalty is covered by Suspension Order S-303.

Data on Safety Contest

The average frequency rate for the first nine months of the 1942-43 safety contest sponsored by the Rubber Section of the National Safety Council is 8.14, an increase of 24% over the same period of the 1941-42 contest, according to a recent bulletin. Rates of large units are up 25% over the first nine months of the previous contest. Van Cleef Brothers, of Chicago, it was reported, still has the largest number of man-hours without a reportable injury in the contest to date.

Cancel Battery Meeting

The Association of American Battery Manufacturers has cancelled its regular Spring meeting, usually held the latter part of May. The action was taken as a means of conserving transportation and hotel accommodations for the armed services, according to B. F. Morris, president of the Association. Problems normally handled at the meeting will be taken care of by special committees, it was stated.

More Names in the News

GEORGE A. SACKETT, associated with the Goodyear Tire & Rubber Co. at Akron for many years, left that company a few months ago and is now head of the chemical division at the Faultless Rubber Co., Ashland, Ohio. MR. SACKETT is also chairman of the Crude Rubber Committee of the Rubber Division, A.C.S.

J. RINES, associated with the Morristown, N. J., plant of the Flintkote Corporation for several years, recently resigned from that company to join the Essex Rubber Co., Trenton, N. J.

C. E. POWELL, associated with the R. D. Wood Co. since 1936, has been named manager of that company's machinery department, succeeding the late CHARLES A. SCHRANZ.

D. W. WALSH, who has been associated with the U. S. Rubber Co. since 1931, more recently in charge of tire sales in branch offices all over the country, has been named general sales manager of that company's tire division.

Desert Motorcycle Tire

The desert motorcycle tire pictured below is now being produced by the Firestone Tire & Rubber Co., Akron, for use in heavy sand areas where con-

ventional tires do not have adequate traction for efficient operation. The size of the tire is 6.00 x 15 and it is inflated to 8 pounds pressure. Contributing to the traction efficiency of the tire is a new tread design, which features a greater degree of flexibility than heretofore attained. This was accomplished by the elimination of all solid circumferential ribs with the exception of one on each side to resist side skid on hard surfaced roads. The center of the tread and the shoulders are of small block design with a row of blocks extending well down the sidewall to protect it when traveling around curves at high speeds.

Akron Plants Suffer Damage

Several of the rubber factories in the Akron area suffered from the effects of the tornado which swept northern Ohio on April 27. Great gaping holes were torn in the De-Icer and fuel tank department offices at the Goodrich plant, while a new research building at the Goodyear plant, which was soon to be dedicated, was practically destroyed. Minor damage was reported by other rubber factories in the area.

Naugatuck Introduces Tuex

Tuex (tetra methyl thiuram disulfide) has been added to the line of accelerators offered by the Naugatuck Chemical Division of U. S. Rubber Co., New York City. The patents covering the manufacture of tetra methyl thiuram disulfide, familiarly known to the trade as Tuads, sold by the R. T. Vanderbilt Co., recently expired. Accelerators of this type are generally used for super aging stocks.

FINANCIAL NEWS

Converse Rubber Company

Year Ended Jan. 31: Net profit of $167,173, after provision of $584,000 for Federal income and excess profits taxes and $70,000 for contingencies, which compares with $151,585 reported for the previous fiscal year. Gross profit on sales amounted to $1,550,681 and net profit from operations to $818,651. The balance sheet as of January 31, 1943, showed total current assets of $2,211,429, including $198,379 in cash, $500,000 in tax anticipation notes and treasury bills, $752,741 in accounts receivable, and $760,308 in inventories, against total current liabilities of $1,384,084.

Brown Rubber Company

For 1942: Net loss of $93,867, after depreciation of $16,017, equivalent to a loss of 46.9c per share, which compares with net profit of $20,780, or 10c a share, in the preceding year. A report by E. A. Callanan, company president, states that the company's plant was shut down for a while during the year, but that a loan of $125,000 from the Smaller War Plants Corp. enabled it to reopen and begin the manufacture of molded goods for one of the larger rubber companies, apparently on a subcontract basis.

Anaconda Wire & Cable Co.

For 1942: Net profit of $1,427,408, after provisions of $6,000,000 for possible liability on contract renegotiations, $7,260,000 for Federal income and excess profits taxes after a post-war refund of $695,000, and $300,000 for contingencies, which is equal to $3.38 a share, and which compares with $2,507,476, or $5.94 a share, reported for 1941, when taxes amounted to $6,200,000 and only $250,000 was reserved for contingencies.

Thermoid Company

For 1942: Net income of $434,445, after provision of $537,412 for Federal income and excess profits taxes, debt retirement credit of $30,000, and post-war refund credit of $5,700, equal to 70c a common share, which compares with $678,609, or $1.20 a share, in the previous year. The 1942 profit is subject to adjustment after renegotiation of government contracts.

General Cable Corporation

First Quarter: Net income of $464,620, after all charges and taxes, which compares with $946,052 in the corresponding quarter of 1942. Gross profit on sales amounted to $4,671,976 and $5,947,834, respectively. Provision for Federal income taxes in the 1943 period amounted to $2,950,000, while $3,784,000 was set aside for the same purpose in the 1942 quarter.

Youmans and Lamela Advance

E. D. Youmans, technical manager of the Okonite Co., Passaic, N. J., since 1928, was elected vice-president and technical director of that company and of its

E. D. Youmans

affiliate, the Okonite-Callender Cable Co. of Paterson, N. J., on April 20. A few days later it was announced that W. F. Lamela, chief chemist of Okonite, had been appointed technical manager in charge of Okonite's research laboratory at Passaic. In his new capacity, Mr. Youmans will have the responsibility of coordinating the entire research program of Okonite and Okonite-Callender, as well as that of the Hazard Insulated Wire Works Division in Wilkes-Barre, Penna.

Mr. Youmans started with Okonite in 1913, obtaining his chemical education by attending evening classes at the Brooklyn Polytechnic Institute while working during the day at the Okonite laboratories in Passaic under the late James P. Millwood, one of this country's outstanding rubber technologists. He served in various capacities until appointed technical manager in charge of the Passaic research laboratories in 1928.

Well-known for his activities in the electrical and rubber industries, Mr. Youmans did considerable work on the wire and cable requirements of the 1940 edition of the National Electrical Code and is currently cooperating with the Office of the Rubber Director and the Army and Navy Ordnance Departments in connection with the conservation of rubber. He is also active in the N.E.M.A., A.S.T.M., and A.S.A., having served as chairman of numerous committees in these organizations, in addition to his work with the Rubber Division of the American Chemical Society.

Firestone has announced the production of a new war tire for farm tractors. The tire is made of reclaimed rubber and will be available in sizes and tread designs for both front and rear wheels.

Who's Who in Washington—and Where

(As of May 10, 1943—Compiled by the Staff of RUBBER AGE)

OFFICE OF THE RUBBER DIRECTOR

New Municipal Building, 4th and D Sts., N.W., Washington, D. C.

Rubber Director—William Martin Jeffers.
Special Assistants—B. W. Rapp and Darrell O. Churchill.
Deputy Rubber Director—Col. Bradley Dewey.
Assistants—Morehead Patterson and Stanley Osborn.
Assistant Deputy Rubber Directors—L. D. Tompkins (Operations), Frank R. Creedon (Plant Construction), E. B. Babcock (Technology and Specifications), R. P. Dinsmore (Research and Development of Synthetics), and E. R. Gilliland (Raw Materials).
Administrative Officer—Frank P. Downey, Jr.
Head, Education Program—Dr. H. E. Simmons, assisted by J. M. Ball (Editorial), E. B. Busenberg (Reclaim), D. F. Fraser (Neoprene), C. W. Sanderson (Thiokol), A. H. Nellen (Tires and Tubes), R. F. Wolf (Butyl), Arthur Nolan (Latex and Dispersions), and W. A. Appeltoft (Statistics).
Assistant to Rubber Director—Kenneth Burgher.
Head, Product Specifications—C. S. Reynolds, assisted by V. R. Grainger, Walter Juve (Wire and Cable, etc.), R. C. Dabney (Tape, Proofed Fabrics, etc.), R. J. Hull (Tires and Tubes, etc.), S. C. Compher (Tire Retreading), and Addis Finney (Revision of Specifications).
Head, Natural Rubber—Atherton Lee.
Manager, Priorities and Materials Control—S. P. Dorsey.
Manager, Allocations—George B. Kayser.
Manager, Requirements and Capacities—James H. Higgins.
Gen. Manager, Allocation and Production—Karl D. Fernstrom.
Supervisor, Mechanical Goods—J. E. Skane.
Research Associates—A. E. Boss, D. A. Cutler, J. C. Elgin, Harry L. Fisher, C. S. Fuller, P. S. Greer, George Haslam, J. E. Hutchman, R. W. Kixmiller, G. Lyons, M. Rea Paul, C. W. Perry, C. F. Prutton, Norman A. Shepard, J. E. Troyan, P. H. Watkins, W. B. Wiegand, and R. R. Williams.

RUBBER DEVELOPMENT CORPORATION

1626 K St., N.W., Washington, D. C.

President—Douglas H. Allen.
Assistants—R. B. Bogardus, James C. Roberts and R. O. Case.
Vice-Presidents—John W. Bicknell, Reed Chambers, Paul McKee and William E. Mitchell.
Treasurer—W. C. Beck.
Head Field Technician—C. B. Manifold.
Associates—Earl M. Blair and W. A. Stanton.
Rubber Analyst—Preston W. Barker.
Distribution Specialist—Richard Cooke.
Chief of Procurement—E. B. Murphy.
Chief Procurement Analyst—A. J. Lockwood.
Chief, Plantations Division—M. D. Knapp.
Assistant Chief—Valentine O. Goodell.
Rubber Specialist—L. B. Proctor.
Administrative Assistants—Curtis E. Anderson, John H. Brunner, Don C. Carnes, Harry A. Carragher, John D. Farnham, Wm. E. Flanagan, Wm. V. Garrett, Walker A. Graham, Alexander Hart, Everett G. Holt, Robert M. Hutchins, Morris K. Jessup, John C. Lang, Wm. Lavarre, Geo. E. Lawrence, Robert E. Lees, Wm. J. McNamee, E. W. Mills, L. B. Proctor, Charles B. Rollins, Harry Shere, G. W. Sniffin, George A. Steiner, Norman F. Sulzbach, Robert G. Walker, R. S. Walter, and Robert Welsher.
Commercial Research—E. G. Holt.
Senior Research Analyst—J. F. Dunbar, Jr.
Assistant Production Specialists—Richard S. Smith and G. R. Ward.

Note: The Purchasing Department is in the H.O.L.C. Building, 1st and Indiana Ave., N.W., Washington, D. C.

RUBBER RESERVE COMPANY

811 Vermont Ave., N.W., Washington, D. C.

Chairman of the Board—Jesse H. Jones.
President—Howard J. Klossner.
Special Assistant—China R. Clarke.
Vice-Presidents—R. D. Young, Henry A. Mulligan, Stanley T. Crossland and John W. Livingston.
Secretary—George H. Hubert.
Treasurer—W. C. Beck, Jr.
General Counsel—H. Clay Johnson.
Consultant—A. L. Viles.
Scrap Rubber—W. J. McCauley.
Latex—Richard Baybutt.
Sales—H. C. Bugbee.
Chief, Administration Division—W. H. Sullivan.

OFFICE OF PRICE ADMINISTRATION

Third and Independence Ave., N.W., Washington, D. C.

Rubber Price Branch

Price Executive—Temporarily vacant.
Chief Counsel—John N. Cole.
Head, Raw Materials and Financial Section—George W. Bolton.
Head, Tire Price Section—Robert V. Mitchell.
Head, Other Rubber Products Section—Everett D. Hawkins.
Head, Rubber Section, Accounting Division—John S. Bartlett.
Head, Rubber Section, Standards Division—T. M. Miller.
Head, Special Projects Section—Kenneth E. Lawton.
Administrative Officer—Arthur F. Schalk, Jr.

Automotive Supply Rationing Division

Director—Charles F. Phillips.
Legal Counsel—David L. Lloyd.
Head, Field Section—H. C. Butkiewicz.
Administrative Officer—John B. Annett.
Chief, Tire Rationing Branch—Robert S. Betten.
Assistant Chief—S. E. Bonnett.
Heads, Tire Rationing Branch—R. G. Leeth (Eligibility Section), A. Koehler (Tire Industry Section), A. G. Richtmyer (Research Section), L. A. Brown (Tire Inspection Section), and R. E. Sewell (Quota Section).

GUAYULE EMERGENCY RUBBER PROJECT

315 West 9th Street, Los Angeles, California

Assistant Chief, Forest Service—C. M. Granger.*
Executive Officer—G. R. Salmond.*
Director—Evan W. Kelley.
Associate—Paul H. Roberts.
Assistant—E. L. Perry.
Chief, Division of Administration and Management—L. C. Stockdale.
Chief, Personnel Management—J. R. Nelson.
Chief, Division of Crop Production—L. S. Gross.
Chief, Division of Lands—G. F. Fine.
Chief, Surveys and Investigation—Dr. W. G. McGinnies.
Chief of Engineering—James J. Byrne.
Factory Superintendent—George W. Miller.
Head, Equipment Maintenance—George L. Bouck.
Principal Plant Physiologist—Dr. W. B. McCallum.
Head, Pilot Mill—D. S. Olson.
Head, Soil Surveys—John L. Retzer.
Director of Research—Dr. A. C. Hildreth.
Physiologist—Dr. Hamilton P. Traub.
Geneticist—Dr. Leroy Powers.
Pathologist—Dr. Wm. A. Campbell.
Agronomist—Delmar C. Pingey.
Rubber Technologist—Rafford L. Holmes.

Note: Most of the personnel listed above are members of the Forest Service, while others are officially members of the Bureau of Plant Industry. They are all located at the Los Angeles address, except those indicated by an asterisk, the latter being located at the Department of Agriculture in Washington, D. C.

ARMY'S CONSERVATION EFFORT REVIEWED IN SPECIAL REPORT

Emphasizing the fact that conservation of rubber for war purposes is not confined to the civilian economy, the Office of War Information, in a special report, recently reviewed the active measures carried on by the Army to effect savings in critically-needed rubber. It is estimated that the Army's program has reduced the use of crude rubber in war material by 45%, compared to rubber used in the same material on December 7, 1941.

Already conserving at the time the war began, the Army Ground Forces adopted further measures to reduce expenditure of rubber more than a year ago—before the civilian population as a whole had to contend with the government's rationing program. It is only in combat, on which depend victory and lives, and in maneuvers, which constitute instruction leading to victory, that stringent requirements for rubber economy are relaxed.

Early in the war, the Army clamped a 35-mile per hour speed limit on all its vehicles and backed up the directive with stern disciplinary action. It has taken steps to avoid unnecessary uses of vehicles even to using bicycles and motorcycles whenever possible for errand and messenger service. At many posts, camps, and stations, animal-drawn vehicles are being used in certain jobs.

Modification Produces Savings

By far the greatest military saving of crude rubber comes through modifications in design. Pedal pads and mats in trucks have been eliminated, airplane vibration pads have been made round instead of square—thus reducing the volume without impairing the function; polyvinyl resins have replaced rubber for insulation on cable and other electric wire, while ceilings have been placed on the rubber content of all Ordnance Motor Transport tires by sizes.

Stringent factory inspection specifications have been relaxed somewhat to accept serviceable "seconds" in tires, and new shipping regulations are designed to provide protection against natural hazards.

The Army has specified the conditions under which tires are to be stored to safeguard them against deterioration. Under these conditions, caps are maintained on all valves, and daily air pressure checks are mandatory when tires are placed on wheels. The Army issues new rubber products from storage only when posts, camps, and stations present worn-out tires in exchange.

Undersecretary of War Robert P. Patterson, in a statement last June, summed up the rubber problem as follows: "The military problem of rubber supply is very simple. In 1941, 92 per cent of our crude rubber supply came from the Far East. Today, because the Japanese Army has overrun the source of supply, that supply is gone. We have to get along with an eight per cent rubber supply, plus the relatively small amount that we can develop by other means. No matter what kind of a mathematical wizard you may be, you cannot fit 100 into eight per cent."

Soon after Pearl Harbor, the Quartermaster Corps took steps to develop a uniform, simplified tread for armored vehicles. A minimum skid depth and a reduction in the gauge of all tubes were "added starters" in this field. Steel wheels were substituted for rubber on such portable engineering equipment for the Army as concrete mixers and portable air compresors.

Tire requirements of Army vehicles constituted 56 per cent of the rubber needs of the Army in June of last year. It is estimated by officials that by 1944 crude rubber requirements per vehicle will be cut 63 per cent as compared to the amount of rubber needed by the vehicle at the outbreak of war. In the case of medium tanks, crude rubber requirements have been reduced by two-thirds. Interior padding has been cut to one-ninth by resourceful conservation with virtually no loss of efficiency in the vehicles.

Motor vehicles, however, are not the only military items which normally need rubber and are feeling the conservation pincers. Raincoats, which formerly contained 40 per cent crude rubber, now are made almost entirely of synthetic resin and oil-treated material. The crude rubber content of boots and overshoes has been reduced by approximately 40 per cent, and the Army is limiting the issuance of rubber footwear to those troops who have immediate need for them. For instance, because leather shoes last only a few weeks under jungle warfare conditions, the Quartermaster Corps developed a rubber and canvas boot for tropical wear. The rubber sole of the new boot contains both crude and reclaimed rubber and is not affected by jungle moisture and soil chemicals, and the cloth top prevents leeches and thorns from reaching the skin.

Save by Using More

Army Engineers hit on one paradoxical plan for saving rubber by first using more of it. They turned the trick by the employment of new rubber pontoons to replace the old aluminum type. The War Department explains it this way:

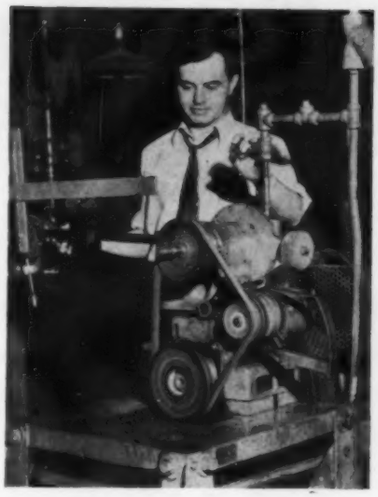
"The standard Armored Force bridge unit, sufficiently buoyant to carry the tanks of the Armored Divisions, consists of 1,080 feet of steel treadway mounted on pontoons. An additional 20 pontoons are carried as 'spares.' To transport an aluminum unit, with necessary treadway, requires 72 trucks with semi-trailers and the rubber required for tires on these trucks amounts to 95,000 pounds.

"Rubber, or rather rubberized fabric pontoons, for the same bridge unit, can be deflated and packed, together with treadway, into 36 trucks, and the amount of rubber used in the pontoons, added to that required for truck tires, amounts to only 65,000 pounds.

"This means a saving of 30,000 pounds of crude rubber for each unit, and this will be expanded when certain synthetics, designed to replace rubber in the construction of the floats, become available in sufficient quantities."

Another brain child of the Corps of Engineers is the redesign of the huge tire tread used on earth-moving equipment such as scrapers and graders. Estimates of the saving here range from 16 to 32 per cent.

Testing New Type V-Belt



The accompanying photograph shows one of the tests used by the Goodyear Tire & Rubber Co. in the development of its new steel cable-carcass V-belt which has been adapted to the engines of military tanks and motorized vehicles as well as to automobiles. The new V-belt, using endless strands of steel cables in place of conventional cotton cords or fabric, is said to have showed many times longer service-life than the best cotton-cord belts in similar tests. In addition, it is reported, each steel cable-carcass belt stretched less than a fifth of one per cent. The test is equivalent to an automobile speeding along at 80 miles an hour.

Boston to Hold Outing

The Boston Group, Rubber Division, A.C.S., will hold its annual outing this year at the Commonwealth Country Club, in Boston, Mass., on Friday afternoon, June 25. An interesting program, including a golf tournament, is planned for the afternoon, followed by dinner at the clubhouse in the evening. James R. Geenty (Sanford Mills) is chairman of the outing committee.

To Construct New Black Plant

Contracts will soon be awarded by the Columbian Carbon Co. for the construction of a new carbon black plant near Conroe, Texas, according to reports. The new plant will cost approximately $500,000, including equipment.

LOS ANGELES NEWS

Jack Elliott, who has been power plant chemist at the Firestone plant, has been commissioned as an officer in the Coast Artillery.

Howard F. Parkerton, Sr., of the Farrel-Birmingham Company, is recovering from an appendicitis operation.

Ed Hull, president of the Tralon Engineering Company of Cleveland, spent some time in Los Angeles during the month of May and covered a portion of the territory with Lombard Smith, local representative of the company.

Jack Britton, of Stanco Distributors, whose home is in the East, spent some time in Los Angeles during the early part of May and attended the May supper meeting of the Los Angeles Rubber Group.

Art Wolff, of the New Jersey Zinc Sales Company, has been making a large number of trips to San Francisco during the past month in the interests of his company.

Dr. David T. Sutton is the new production control engineer for Western Insulated Wire, Inc. Dr. Sutton is a local man and was connected with the rubber business several years ago.

Three different rubber manufacturing plants in Los Angeles were threatened with fire during the past month from buildings burning close to them. The Union Rubber Company had to fight fire when the plant of the Toyad Corporation close by was destroyed. A large laundry burned adjacent to the W. J. Voit Rubber Corporation. The Sierra Rubber Company was also endangered when the plant of a paint company nearby was burned to the ground.

W. R. Richardson, general manager of the industrial products division of the B. F. Goodrich Company, Akron, Ohio, spent a portion of May in Los Angeles visiting the local plant.

W. J. Hoyt, of San Francisco, head of Martin, Hoyt & Milne, Inc., visited the Los Angeles office early in May.

H. C. Kline, sales manager of the rubber-lined equipment department of the B. F. Goodrich Company, Akron, was in Los Angeles a few days early in May.

Bill Haney (Kirkhill) and George Steinbach (Royal) have both returned from a trip to Detroit where they attended the convention of the American Chemical Society.

Phil Drew, of Goodyear, visited the home plant in Akron, Ohio, during the past month.

Vic Vodra, local representative of R. T. Vanderbilt Company, Inc., spent several weeks in the east this spring. He visited the laboratory at East Norwalk, Connecticut, where he spent some time and on the way home made business calls in Seattle, Portland and San Francisco.

A fire badly damaged the plant of the Toyad Corporation at 832 East 62nd Street. This company manufacturers cells for rubber-covered fuel tanks.

Second Lieutenant Fred Huntoon, now a member of the Army Quartermaster Corps, recently visited the Goodyear plant. Fred left Los Angeles in October and prior to his furlough was stationed in the Hawaiian Islands where he was in charge of a large gasoline depot. He has also been stationed in Virginia and is now at the Air Force base in Salt Lake City.

Another step forward in the development of Western industry occurred at the plant of Western Insulated Wire, Inc., at 1001 East 62nd Street, on April 20 when the company finished its first run of the largest size all-rubber jacketed electrical cable yet manufactured on the Pacific Coast. The cable is known as Type S or Type W, four-conductor, #4, all-rubber portable cable, and has an outside diameter of approximately 1½ inches. It was processed at the plant from the stranding of the individual bare copper wires to the completed cable. This achievement puts Western Insulated Wire in a position to fabricate electrical wires from size #22 to #4, inclusive, made in individual as well as multiple conductors, and as large as #4-0 in welding cable.

Charge Fraud in Fisk Sale

Charges of conspiracy to defraud holders of common stock of the dissolved Fisk Rubber Corporation were laid before Chancellor W. W. Harrington, of Wilmington, Delaware, by two such stockholders on May 6. The charges also alleged that damages of more than $5,000,000 had resulted from the sale of Fisk patents to the U. S. Rubber Co. for A. L. Fisk. The petition named 10 directors of Fisk at the time of its dissolution in the Spring of 1940 and alleged that they had conspired with U. S. Rubber and others "to sell and transfer assets to U. S. Rubber" at a price "below the true value of the assets and for personal gain."

TALK ON TOURIST TRADE HEARD BY LOS ANGELES RUBBER GROUP

An address on the tourist possibilities in Southern California after the war, given by Jack Little, substituting for Don Thomas, managing director of the All Year Club of Southern California, who was unable to appear because of illness, featured the regular supper meeting of the Los Angeles Group, Rubber Division, A.C.S., held on May 4 in the Rainbow Room of the Hotel Mayfair in Los Angeles. Approximately 105 members and guests were in attendance.

The address dealt with the enormous cash income of the tourist industry, the figure running in normal years above $200,000,000. The speaker stressed the fact that this type of industry, representing the hard cash income business, never suffered from depreciation of stock nor did it become obsolete. He pointed to it as a potential factor in the economic set-up of the west after the war.

Another major feature of the program was the showing of a color and sound picture, "Die Casting." This picture was presented by the New Jersey Zinc Sales Company through their local representative, Arthur E. Wolff. The picture showed the many uses to which zinc and magnesium alloys are being put because of the lightness of such metals.

Three new members were voted in, reports of two committee chairmen were heard, and the summer outing at the Uplifters' Club was discussed. This event at the Uplifters' Club was held for the first time last year and proved very popular.

Table favors were supplied by Avery Adhesives and Latex Seamless Products Company through the courtesy of Carl E. Stentz. The door prize, a beautiful table lamp, was won by Curtis R. Wolter of the United States Rubber Company. A special prize, a Hickok set, was won by Charles A. Sickels, of Standard Rubber, Inc. These two prizes were also supplied through Carl Stentz.

A $3.75 bond, presented by MacNeel Pierce, of the Plastic & Rubber Products Co., was won by R. C. Banta of the Kirkhill Rubber Company. A $5.00 bond and a $10.00 bond, by the same donor, were won by Monty Montgomery of Martin, Hoyt and Milne, Inc., and Gregory Smart, respectively.

Announce Channel-Tread Tires

Channel-tread tires to insure greater safety and permit heavier loads for warplanes have been announced by the Goodyear Tire & Rubber Co., Akron. Originally devised for the fast, heavily-armed Airacobras, the newly-designed tires are finding applications in warplanes of all types. In addition, it was revealed, their use is being extended to tail wheels which, in turn, permit the heavier loads. The channel-tread tires were particularly designed to enable planes to land and take-off from soft and muddy ground.

CANADIAN NEWS

The Office of the Rubber Controller, Department of Munitions and Supply, has issued Order No. Rubber Five which consolidates into a single order all previous orders relating to the processing of natural, reclaimed and synthetic rubber.

J. A. Martin, deputy rubber controller, emphasized that the new order does not in any respect alter any of the regulations issued by the Rubber Controller in the past and which remain uncancelled.

The order includes Schedules "A" and "B" which have been brought up to date in regard to all instructions in force regulating the use of rubber in making various articles. Schedule "A" contains a list of classes of rubber products. No rubber of any kind may be used in the manufacture of any class of rubber products unless the class appears on this list. Schedule "B," part one, contains a list of specific articles in which no rubber of any kind may be used; and part two contains a list of items in which only reclaimed rubber or scrap may be used.

Another recent order from the Rubber Controller's office provides that no rubber-lined cotton fire hose may be sold except under certificate that such hose is needed immediately for protection against fires.

James I. Simpson, president and general manager of the Dunlop Tire and Rubber Goods Co., has been elected president of the Rubber Association of Canada. Mr. Simpson is also chairman of the advisory committee to the Rubber Controller.

The Dominion Rubber Company will, within a short time, bring into operation a new small arms ammunition project. According to information from Ottawa, entire production of the plant will be for the United Kingdom. The type of ammunition to be manufactured has never previously been made in Canada. Originally scheduled for the Dominion Arsenal, at Quebec, the project was turned over to the rubber firm when sharply increased production at the arsenal made it impossible to undertake any new jobs.

Gutta Percha and Rubber, Ltd., Toronto, is celebrating its sixtieth year of operation this year. As a souvenir of its diamond jubilee the company has issued a notebook which includes a brief account of the history and operations of the firm.

Granby Elastic Web, of Granby, Quebec, reports that in 1942 the company enjoyed the largest volume of business in its history. Total earnings were $643,624, as compared with $301,733 in 1941. Net profit amounted to $80,062, compared with $64,390 for the previous year. An initial dividend of twenty-five cents a share was paid on the company's common stock last year.

James I. Simpson
newly-elected president of the Rubber Association of Canada.

The Northern Electric Company, Ltd., reported a marked increase in operating profits for 1942. After provision for taxes, net profit was about the same as for the previous year, however. The operating profit for 1942 was $5,407,614, compared with $4,238,857 for 1941. Net profit was $981,368, compared with $981,910 for the previous year. Surplus for the year amounted to $33,368 which, when added to previous surplus, resulted in an earned surplus carried forward amounting to $4,378,014.

Reinforcing-Type Plasticizers

The Barrett Division of the Allied Chemical & Dye Corp., 40 Rector St., New York City, recently introduced a new line of coal tar products which act as reinforcing-type plasticizers. These include the following: Plastender, a hydrocarbon product in flake form which carries a minimum of 22% free carbon in finely dispersed form; Plastender S, which is Plastender modified with 5% stearic acid for greater ease of milling in plantation or reclaimed rubber; and Plastender SD, which is the lowest melting of the Plastenders and which may be dispersed in all reclaim compounds on open mills.

New Emergency Specifications

In line with its endeavor to aid in the procurement and conservation of rubber, Committee D-11 on Rubber Products of the American Society for Testing Materials has set up two new emergency specifications covering Chloroprene (Neoprene) Sheath Compound for Electrical Insulated Cords and Cables (ES-28) and the same material when extreme abrasion resistance is not required (ES-30).

The development of these specifications, which will be published next month, has been accelerated because WPB recently advised the wire industry that the use of rubber for jackets will be prohibited and that neoprene would be allocated. If specifications were not available, and there is at present no industrial standard, it was felt that the switchover would create a chaotic situation, and although it is expected that GR-S (Buna S) will eventually be used it is not considered essential to cover such use at present.

Committee D-11 feels that where the new synthetic materials are being substituted for crude rubber or reclaim, separate standards should be established since the synthetics for electrical use may not be interchangeable with each other.

The new emergency specifications cover methods of tests, physical requirements, and include an oil immersion test and other requirements.

Pharis Tire May Expand

The purchase of the oil refining and asphalt property and equipment of the Southport Petroleum Corp., Mt. Pleasant, Texas, is under consideration by the Pharis Tire & Rubber Co., of Newark, Ohio, according to a recent notice sent to the company's stockholders. Carl Pharis, president, said the purchase would raise problems of financing and would involve the company in a new business, and revealed that a New York investment firm had been employed to make a complete examination and report on the advisability of the Southport purchase.

Offers Consulting Service

Philip Tucker Gidley, formerly associated with the Acushnet Process Co., New Bedford, Mass., as technical manager, has resigned from that company and has entered the consulting field as a specialist on synthetic rubber. Mr. Gidley has established a laboratory in Fairhaven, Mass., and is prepared to engage in research, product development, processing methods, and the furnishing of special formulae.

Keystone Brass & Rubber Co., Inc., Philadelphia, has introduced a line of plastic stoppers for basin, bath and sink under the trade-name of "Air Seal." One size stopper will fit several size drains, while two handy sizes will fit all drains from 1 to 2 inches.

OBITUARIES

Ellwood B. Spear

Ellwood Barker Spear, prominent rubber technologist before his retirement in 1929, and one-time manager of the research department of the Goodyear Tire & Rubber Co., died of a heart attack at his farm in Milford, N. H., on May 1. He was 68 years of age.

Born on February 22, 1875, in Aurora, Canada, Dr. Spear attended the University of Manitoba and did post graduate work at the University of Toronto and the University of Heidelberg, receiving his Ph.D. from the latter university in 1907. He was associated with the Massachusetts Institute of Technology from 1907 to 1920, first as research associate instructor and subsequently associate professor of chemistry.

The late Dr. Spear from a photograph taken in 1926.

In 1920, Dr. Spear joined Goodyear at Akron as manager of that company's research department, remaining with the company until 1923 when he left to become chief chemist of the Thermatomic Carbon Co., of Pittsburgh, Penna. He served with Thermatomic for some six years, during which period he did a great deal of development work on P-33, making frequent trips to the company's factory at Sterlington, La. Leaving the company in 1929, Dr. Spear bought a farm in Milford, N. H., where he first experimented with breeding pedigreed dogs, later becoming a dairy farmer, specializing in milk products. He operated the farm up until his death.

Dr. Spear was a frequent contributor to the technical literature of the rubber industry. He also translated Szigmondy's book on "Colloidal Chemistry," believed to be the first treatise of its kind. At one time he was an active member of the American Chemical Society.

Henry Douglas Reed

Henry Douglas Reed, president of the Bishop Gutta-Percha Co. and the Bishop Wire & Cable Co., both of New York City, and the Peters Manufacturing Co., of Wollaston, Mass., died at his home in East Orange, N. J., at the age of 74, on April 27, after an illness of three weeks. Mr. Reed spent his entire career in the rubber industry.

Born in Poughkeepsie, N. Y., Mr. Reed was educated at the Newark, N. J., High School and Stevens Institute, Hoboken, N. J. He joined the Bishop Gutta-Percha Co., which was organized in 1847, as an electrical engineer in June, 1892. He advanced rapidly from post to post and was elected president of the company in 1919.

In addition to manufacturing gutta-percha specialties, the Bishop Gutta-Percha Co. also manufactured wire and cable. When the Bishop Wire & Cable Co. was formed in 1924 to take over the wire and cable end of the business, Mr. Reed became president of that concern as well. The latter company sold its wire and cable machinery to Anaconda in 1941, following a long strike which held up production. About 10 or 12 years ago Mr. Reed acquired a financial interest in the Peters Manufacturing Co., which produces proofed goods, and became president of that concern, holding the position until his death.

Mr. Reed was widely known in the insulated wire and cable field and was a recognized authority on such insulation. A widow survives.

Harry V. Pohle

Harry V. Pohle, secretary and factory manager of the National Latex Products Co., Ashland, Ohio, died suddenly from a heart attack at his home in Ashland on April 9 at the age of 55. A resident of Ashland since 1911, Mr. Pohle spent his entire career in the rubber industry.

Born on December 27, 1888, in Akron, Ohio, Mr. Pohle went to Ashland in 1911 to work for the Faultless Rubber Co., where he remained for two years. In 1913, when Harry R. Gill formed the Eagle Rubber Co., Mr. Pohle joined that company in the post of secretary and factory manager, remaining with the company until 1939. In the latter part of 1939, Mr. Gill left Eagle Rubber to organize the National Latex Products Co., and again Mr. Pohle joined him as secretary and factory manager of the new company, serving in that capacity at his death.

Mr. Pohle was active in the Masonic Lodge and the Shrine. He was formerly a member of the Lions Club of Ashland and formerly attended the Trinity Lutheran Church.

David H. Cox

David H. Cox, inventor and manufacturer of the Cox patch-and-plug, well known to bicyclists and motorists some twenty years ago, died at his home in Elizabeth, N. J., on April 24, at the age of 77, after a long illness. Mr. Cox, who retired about 15 years ago, was a former associate of Thomas A. Edison. Born in Elizabeth, Mr. Cox resided for a time in Roselle, N. J., where the shop in which he invented and manufactured tire accessories still stands. At one point in his career, he was hired by John Willys, then beginning the manufacture of automobiles, to tour the country to demonstrate both the new Willys car and the tire patch, used on tires which did not have tubes. Mr. Cox leaves a widow and a daughter.

Labor Troubles Beset Akron

A series of short strikes, many of them "wildcat" in nature and unauthorized by the rubber union, hit rubber factories in Akron within the past several weeks. At General Tire, 220 workers in the life belt department walked out in protest over new piece work rates. At Goodyear, 500 workers in the tire division of Plant 2 were idle for a time because of a strike of a small group of women band builders in protest of a time allowance for lunch hours. At Goodrich, a one-day holiday for June 2 was threatened by the union unless WLB acts favorably on recommended wage increases.

Science Librarians to Meet

The Science-Technology Group of the Special Libraries Association, representing engineering, chemical, rubber, utilities, and aeronautical libraries, will hold a special meeting as part of the Second Wartime Conference of the Association, to be held at the Hotel Pennsylvania, in New York City, on June 22 to 24. Short-cut methods for finding the information which industrial libraries are now so heavily called upon to produce will be one of the major discussions at the meeting. Miss Elsie P. Garvin, Eastman Kodak Co., Rochester, N. Y., is chairman of the Science-Technology Group.

Chicago to Hear Taylor

G. A. Taylor, of Stanco Distributors, Inc., will be the principal speaker at the next meeting of the Chicago Group, Rubber Division, A.C.S., to be held in the Terrace Casino of the Morrison Hotel in Chicago, Ill., on Friday, June 4. Mr. Taylor will speak on "Compounding and Processing of Butyl Rubber." This being the group's last regular meeting of the current season, the election of officers for the 1943-44 season will be held.

VULPRENE

Replacement for Crude and Reclaimed Rubber

VULPRENE is the generic name for a series of long-chain polymers, similar to Norepol, and derived from fatty oils. They are available in various forms, from viscous through tough rubber-like vulcanizates, and are suitable as replacement materials for crude and reclaimed rubber in insulation, coating and molded goods where extreme flexibility, tensile and abrasion are not required. They can be compounded, milled and vulcanized in the usual manner.

Other Products for Use as Replacements, Modifiers and Extenders for Latex, Reclaims and Synthetics

RESIN AND LACQUER EMULSIONS—These emulsions are being used today as *Latex Modifiers* and *Complete Latex Replacements* to extend, thicken, stabilize, increase penetration, improve resistance to acids, oils and solvents; in *Coatings* to produce adherent pigmented or clear coatings on paper, fabric, and rubber and as intermediate coats for lacquer on rubberized cloth; in *Rubberizing* textiles; in *Latex Treated Papers* to increase strength and improve ageing; in *Adhesives*, for paper, for leather to cloth, and cloth to cloth.

VULPRENE SOLUTIONS AND DISPERSIONS. These forms of Vulprene are being used for adhesive tapes, marking papers, water-resistant coatings, etc. *Vulprene Latex* is used as a latex extender particularly as shoe adhesives, for impregnation of paper, can sealing compounds and coating materials.

ALKYD 18—an alkyd type resin emulsion which is non-yellowing and non-oxidizing. Film is water-white and non-tacky. Preferred where slight oxidizing action may be considered harmful to rubber. Extender for latex in coating, combining and impregnating process.

EMULSION 58-8—a series of emulsified elastomers containing up to 65% solids. Recommended for use as full latex replacements in impregnation and combining.

PIGMENT BASES—concentrated aqueous dispersions of pigments in resin bases, available in all shades and viscosities, suitable for spreading, spraying, etc.

Also Acrylic, Vinyl, Maleic, Phenolic, Hydrocarbon, Ethyl Cellulose, Cellulose Acetate and Nitrate emulsions and solutions for various applications.

WE'RE SORRY!—We have received so many inquiries in recent months for data and samples of our products that it has not always been possible to acknowledge them promptly. If you have not received a reply, please bear with us and we'll try to answer your request as soon as possible.

AMERICAN RESINOUS CHEMICALS CORPORATION

Rubber Substitutes • *Rubber Synthetics* • *Resin, Lacquer Emulsions*

MAIN OFFICE and LABORATORIES

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Factory Branches: Newark, N. J. and Chicago, Ill.

Improve the tack WITH

CRYSTEX insoluble SULPHUR

Crystex, an amorphous sulphur, improves the tack by preventing bin-cure and dryness which usually occur when a high percentage reclaim compound is used.

Crystex prevents bloom in uncured rubber stocks. It does not dissolve in rubber but will "stay put" at temperatures usually prevailing during storage periods. Crystex is of outstanding value when employed in the manufacture of stocks to be used for repair materials, in retread stocks, valve-patch frictions, and other products.

The characteristics of Crystex indicate that further uses may be found for this product in the rubber making industry.

OTHER RUBBERMAKERS' CHEMICALS

Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure
Carbon Tetrachloride, Carbon Bisulphide
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420 LEXINGTON AVE., NEW YORK, N. Y.
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424 OHIO BUILDING, AKRON, OHIO
NORTH PORTLAND, OREGON
HOUSTON, TEXAS APOPKA, FLORIDA

Some Interesting Data on Kok-Sagyz*

IN THE FIELD of natural rubber our organization's work has been solely with the Russian dandelion, *kok-sagyz*. This plant, which may be called the good-will ambassador of the fields, offers a great promise to American agriculture for it can be grown in at least forty of the forty-eight states, whereas guayule is limited apparently to the soil and climatic conditions of the Southwest, and cryptostegia is confined to the region of Florida and the Gulf Coast. Since we are deeply interested in a reliable and constant supply of natural rubber, this extension to other areas of the country with all their varied seasonal conditions will minimize the chances of crop failure. *Kok-sagyz* is planted and harvested within one crop year, whereas guayule takes four in order to produce a substantial crop. Like guayule, *kok-sagyz* lends itself to machine methods of planting, cultivation, and harvesting. Also, valuable by-products from it are being utilized.

Last May (1942) seed was obtained from Russia through the efforts of the National Farm Chemurgic Council working with Congressional Representative August H. Andresen of Minnesota. On May 9th, the Bureau of Plant Industry of the United States Department of Agriculture received its first shipment of this dandelion seed from Russia, and it was distributed exclusively by them. On May 16th, we received our first shipment.

Before we planted it, this seed was vernalized in the following manner: On May 16th it was soaked in water for three hours, then it was removed and spread on a flat surface 3 cm. thick. It was held at room temperature for three days, and turned over every two or three hours for aeration. At this point 10% of the seed was germinating. Then, until May 22nd, all of the seed was held at 40° F. Just prior to planting, the seed was mixed with two parts of peat moss to provide a satisfactory planting mixture. A laboratory germination test of the seed showed 95% germination after 14 days, thus proving the seed to be of high quality.

The first plot was started May 22nd and May 23rd of 1942. The ¾ acre plot was plowed to a depth of eight inches, roto-tilled, and then hand raked twice. Chemical analysis of the soil indicated an acid reaction, pH 6.6. The total nitrogen and total phosphorous was 2,140 and 1,580 lbs. per acre respectively on a seven-inch acre basis. The Bray test was high. The potash content on the same basis was 368 lbs. per acre. After preparation the soil was limed at the rate of one ten per acre. Sowing of the vernalized seed to a depth of ½ inch by means of a Planet Junior Garden Seeder was begun on May 31st and completed June 2nd. Six seeds were dropped every four inches in 20-inch rows.

The first week the plot had to be watered to provide sufficient moisture. During the next thirty days, however, we had seven inches of rainfall throughout several heavy storms. Unfortunately the raw markings were obliterated, much of the seed was washed out, and cultivation was prevented. As a result, weed growth obliterated the plot. Careful examination failed to reveal germinated *kok-sagyz* after 45 days. This particular plot was abandoned.

Vernalized seed prepared and shipped by the Bureau of Plant Industry was received on May 26th. It was held at 40° F. until May 31st when the second

* Abstracted from a talk on "Chemurgic Rubber," delivered by Dr. Paul Kolachov, technical counselor, Joseph E. Seagram & Sons, Inc., Louisville, Kentucky, at the Ninth Annual Chemurgic Conference, Chicago, Ill., March 25, 1943.

plot was prepared and in the same manner as the first one, except that it was not limed. Chemical analysis of the soil revealed a pH of 6.4. The total nitrogen, phosphorous, and potassium content on a seven-inch acre basis was 1,840, 1,740, and 260 lbs. respectively. In the same way as the first plot planting was begun May 31st and completed June 2nd. This plot suffered the same fate as the first and was abandoned on July 5th when no trace of seedlings could be found.

A portion of untreated seed from the May 16th shipment was planted in the greenhouse on May 19th. On May 26th the first sprout appeared and by the end of 14 days, 95% of the seed had sprouted. During the week of August 13th and 18th about 8,000 plants were transplanted. The soil had been replowed to seven inches, roto-tilled, and then hand raked. The plants were watered frequently, and this moisture together with the normal rainfall helped to make growth satisfactory. A garden plow and hoe were used for cultivation.

This test, still in progress, has been quite successful. A few plants failed to grow but the majority have developed nicely. Leaf rosettes (40-60 leaves) have formed; at present 6,189 of the transplanted plants have survived and grown. Three distinct varieties have been observed; each one has bloomed. Blooms were first observed on October 19th, 29th, and November 4th. On November 6th, 54 plants were potted and taken to the greenhouse to compare with the field development. The majority of the plants will be left in the field to determine winter hardiness. As yet they have not reached full maturity although the average root size is now six inches in length and about ½ to ¾-inch in diameter at the top. These plants are expected to survive the winter and bloom in the spring. At such time, seed will be harvested. A number of roots will be harvested for chemical analysis.

A fall test-plot of one acre was sown on October 12th and 14th. The soil was plowed to a depth of eight inches, double disked, and then planted. Three pounds of seed were used in continuous planting in 20-inch rows. Untreated seed was planted October 18th, and vernalized seed on October 14th. On November 11th, the vernalized seed had sprouted whereas no growth of the untreated seed was evident.

For preliminary tests, the above results are very encouraging. The seed was received late, and in large measure this is why the two plots failed. The same weather conditions at normal seeding time would have caused but minor damage. True, the plot that had been carefully nurtured by greenhouse care was successful throughout the early stages, but this special treatment was necessitated by off-season planting. The early results of fall planting indicate that vernalized seed may be best.

As yet, we have conducted no research on the carbohydrate content of the root. Russian scientific literature reports that the roots contain 12% inulin. This would produce 45 gallons of 190 proof alcohol or 137 pounds of butadiene by the glycol process. The glycol yield would be 250 pounds per acre. Here is a study which could be made of the value of a by-product.

Savage Tool Co., Savage, Minn., manufacturers of the Doall precision surface grinder, has announced the availability of **Doall Master Gage Blocks.** A standard set, designated as Set 400, consisting of 81 blocks, is being produced in quantity at present.

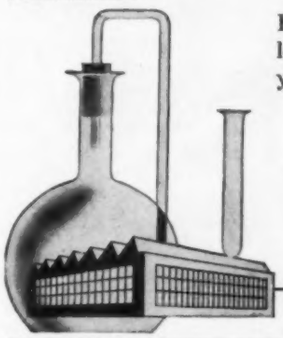
PR-149 LATEX EXTENDER

Extends Latex and Substitute Emulsions

Also being used in some instances as an adhesive itself.

PR-149 EXTENDER permits dilution of Rubber Latex, Reclaim Rubber Dispersion, and other dispersions both for saving basic materials and to modify dry films.

Although PR-149 is excellent for Latex compounding, its use should be investigated as a new material for adhesive and coating formulations.



For further information, write us a letter giving all disclosable details of your particular problem.

UNION BAY STATE Company

50 HARVARD ST., CAMBRIDGE, MASS.

RANDALL & STICKNEY

Hand Grip Rubber Gauge No. 3-B

Height .....9"	Length .....9¾"	Range .....½"
Depth of Throat ....6½"	Dial 50 Divisions Each Div. 1/1000"	Weight .... 4 lbs. Frame . Aluminum

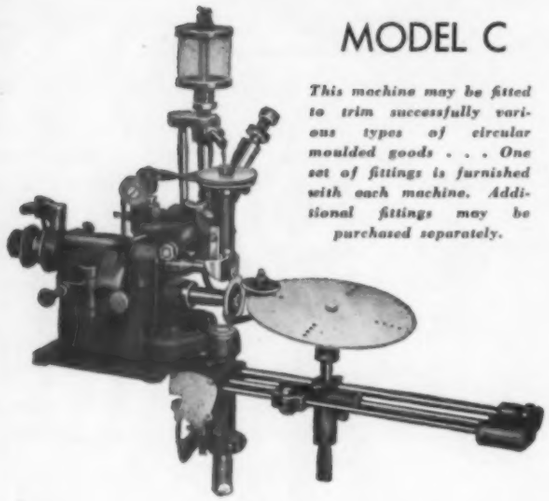
Designed for gauging stock as it is coming from the calender.

FRANK E. RANDALL, Waltham, Mass.

USMC TRIMMING MACHINE

MODEL C

This machine may be fitted to trim successfully various types of circular moulded goods . . . One set of fittings is furnished with each machine. Additional fittings may be purchased separately.



A new and improved machine for trimming the overflow on all types of moulded rubber heels, soles, taps, and miscellaneous moulded rubber goods of similar construction.

Oil is the standard means of lubrication. A water tank is shipped, only when specifically ordered, at an extra charge.

When ordering a machine for trimming other than regular half heels, soles, or taps, samples should accompany the order to determine fittings.

UNITED SHOE MACHINERY CORPORATION

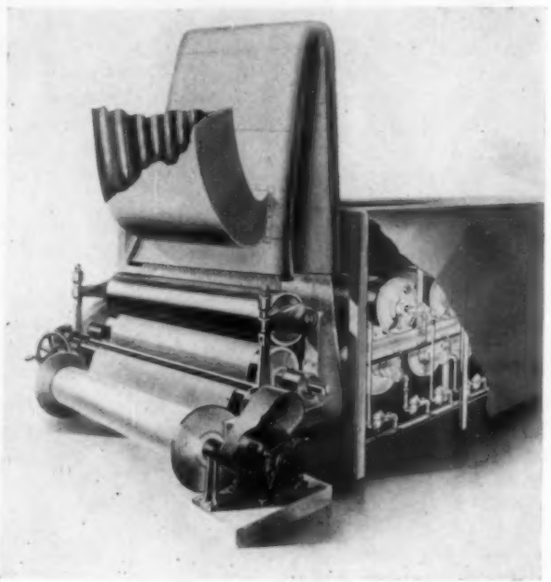
140 Federal Street, Boston, Mass.

Auburn, Maine..38 Minot Ave.
Brockton, Mass.....93 Centre
Chicago, Ill...500 So. Franklin
Cincinnati, O...407 East Eighth
Harrisburg, Pa...20 So. Fourth
Haverhill, Mass.....143 Essex
Johnson City, N. Y.
19 Jennison Ave.
Lynn, Mass.....525 Union
Milwaukee, Wis...822 N. Fourth
Nashville, Tenn., 901 Church St.
New York, N. Y., 110 Fifth Ave.
Philadelphia, Pa., 221 No. 13th
Rochester, N. Y.
60 Commercial St.
St. Louis, Mo.
2200 Washington Ave.
San Francisco, Cal., 859 Mission
Worcester, Mass....71 Mechanic

NEW EQUIPMENT

Range for Impregnating Tire Cord

Rayon tire cord is now being impregnated with latex at high speeds on a continuous process machine by one of the leading tire manufacturers. The installation (pictured herewith) uses the padding technique of immersion in latex, squeezing between rollers and drying on cans, taking care that the solution is so adjusted to

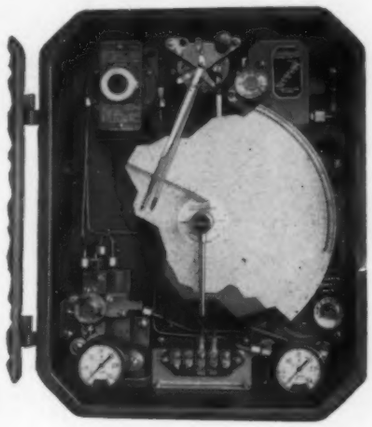


the pick-up that the proper amount of latex impregnates the rayon cord. The range begins with the feeding of the rayon cord into a 2-Roll Micro-Set Padder. After the squeeze under four thousand pounds pressure, the cord passes through a heated flue built in the shape of an inverted "U." This pre-drying speeds up the whole process. Next, the cord passes over a series of twenty-two steam-heated drying cans, arranged horizontally, and is wound onto a slip belt winder at the end of the range. It takes 40% less time to impregnate the rayon cord with latex in the continuous process range than the best speeds formerly attained. All of the rayon cord being impregnated on this continuous process range is used for military purposes, particularly aircraft tires where rayon saves approximately four pounds of rubber per tire, runs cooler and withstands the shock of high-speed landings. The impregnating range was designed and built by H. W. Butterworth & Sons Company, Philadelphia, Penna., based on their experience with finishing ranges in the textile industry.

A complete line of **industrial a.c. arc welders** has been added by the Harnischfeger Corp., Milwaukee, Wisconsin. Engineered and built for industrial service, these machines are being made in 7 heavy duty and 4 intermittent duty models with a range of capacities for handling production welding under continuous operation.

Automatic-Manual Unit for Controllers

Although automatic control for continuous processing is highly in demand by modern industry, it is still often desirable to exercise manual control. To meet the demand for supplementary control a new Automatic-



Manual Control Unit, incorporating several improvements over former models, has been introduced by the Taylor Instrument Companies, Rochester, N. Y.

When the new unit is in a "manual" position, controlling air pressures are also applied to the idle mechanism of the Fulscope Controller which is thus maintained in constant balance with the process. Because of this balance, control can be changed instantly from "manual" to "automatic" without causing process disturbances. In addition to the three usual positions, "automatic", "manual" and "service", this new unit contains a fourth step, "test". Set at "test", control is manual but the full 20 p.s.i. supply pressure is applied to the instrument mechanism to make possible its complete and accurate readjustment without disturbing the position of the controlled diaphragm valve.

The Automatic-Manual Unit is designed to be installed entirely within the case of a Fulscope Single Duty Recorder Controller. It can be supplied already installed in new instruments, or it may be added to equipment already in the field, without the need of either drilling or tapping the Fulscope Instrument. All tubing is supplied preformed for ease of attachment.

A new line of **totally enclosed motors**, the most recent addition to the well-known group of Tri-Clad motors, has been announced by the General Electric Co., Schenectady, N. Y. The new line is especially designed for use under conditions where abrasives, chemicals, rain, snow, and excessive dirt are encountered.

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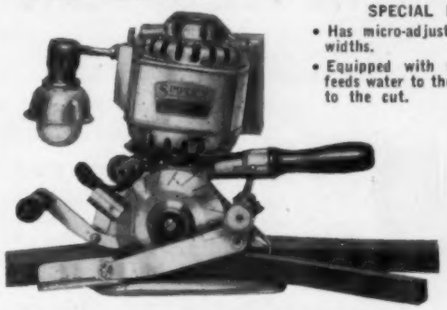

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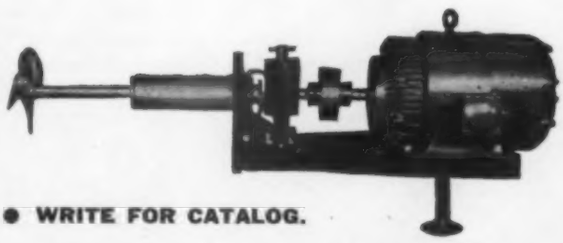

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Ross Air Speed Control Valve

An Air Speed Control Valve which provides and maintains accurate split-second timing of piston movements has been announced by the Ross Operating Valve Company, 6453 Epworth Boulevard, Detroit, Michigan.

It is said that starting with full capacity flow in both directions, the flow in one direction can be controlled over a wide range to a completely closed position. A greatly increased range of selective speeds is obtained through a vernier-like adjustment mechanism. A specially designed stem and floating bevel seat poppet maintain a positive steady control at any selected speed. The manufacturers offer to send performance graphs to engineers upon request.

Convertible Free-Vane Controller

A new air-operated automatic control instrument, known as the Convertible Free-Vane Controller, has been announced by the Bristol Company, Waterbury, Connecticut. The new instrument is made for automatically controlling temperature (up to 3600°F.) flow, liquid level, pressure, draft humidity, pH value, and time program. The Convertible Free-Vane Controller operates on the same basic Free-Vane principle as that used in previous models offered by the company. In the new controller a number of design refinements have been incorporated, which simplify the instrument and make it more convenient to service. The new instrument is also designed so that the user can convert from one type of control system to another. The controller is offered in the following types: Monoset (On and Off), Ampliset (Throttling), Preset, Reset, and Magniset. The adjustments for fitting the controller to the requirements of the process are located on a dial board above the chart.

A new **slitter wheel grinder**, which will recondition any standard 3-inch cut slitter in a fraction of the time generally required, has been marketed by the Johnstone Engineering & Machine Co., Downingtown, Penna. It is small enough in dimension so that it will fit on a portable stand or work bench.

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REVIEWS

BOOKS

Plastics—From Farm and Forest. By E. F. Lougee. Published by Plastics Industries Technical Institute, 221 No. La Salle St., Chicago, Ill. 4½ x 6¾ in. 157 pp. $2.00.

As the author states in his preface, this interesting little book was not written for those who know plastics, but rather for those who know little or nothing about the subject but would like to learn more. Stress is placed upon the versatility of the present-day plastics, how broad their scope really is, and how far-reaching their applications in service are likely to become. In the latter respect, Mr. Lougee states, this is due largely to the fact that plastics are chemical compositions which can be tailor-made in the laboratory to fit specific needs.

The growing alliance between agriculture as a source of raw materials and industry, which has been manifest for many years, is skillfully traced by the author. Avoiding the technicalities of chemical or mechanical processes, he outlines some of the important uses of farm and forest products in industry and reviews them in order to emphasize how farm chemurgy and research have been put to work during the present generation. Rubber comes in for consideration in this regard, and an entire chapter is devoted to guayule and various rubber-like materials, including the bunas, neoprene, Thiokol, Koroseal, and Resistoflex.

The book has 10 chapters in all, and contains a list of experiment stations maintained by the U. S. Department of Agriculture. Mr. Lougee, the author, is a former editor of *Modern Plastics* and has served as chairman of the Advisory Board of the Plastics Institute since its formation in 1940.

•

Practical Emulsions. By H. Bennett. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N. Y. 5½ x 8½ in. 452 pp. $5.00.

This is a practical book written for the practical worker. It touches only lightly on the theoretical aspects of colloidal chemistry, leaving this complex subject to the several excellent books available, and concentrates on the art of making and applying emulsions. The author has not attempted to compile a complete record of all published works on emulsions, but rather gives sufficiently diverse examples to illustrate the advances in this field. Because emulsions are used in so many varied fields, from textiles to pharmaceuticals, the book, of necessity, covers a wide range.

The book is divided into two sections, the first devoted to general information and the second to formulas. There are 31 chapters in all, nine in the first section and twenty-two in the second. In addition, there is a completely cross-referenced index. Brief mention is, of course, made in various chapters to rubber and latex dispersions and emulsions, one complete chapter being devoted to "Resin and Rubber Emulsions." Included among the formulas in the latter chapter are those for rosin, resin, paraffin rosin, cumar, ethyl cellulose, methyl methacrylate, cellulose ester, polystyrene resin, and vinylite emulsions. In many cases more than one formula is given.

•

Electrical and Radio Dictionary. Prepared by Carl H. Dunlap and Enno R. Hahn. Published by the American Technical Society, Drexel Ave. at 58th St., Chicago, Ill. 5½ x 8¼ in. 110 pp. $1.00.

This new electrical and radio dictionary, which is an enlarged edition of the electrical dictionary previously issued by the company in paper-bound form, contains easy-to-un-

derstand definitions of electrical and radio terms. In addition, it contains several pages of symbol drawings and opposite each is a picture of the object the symbol represents. Furthermore, several motor and starter diagrams are included, as well as numerous electrical formulas and handy tables relating to energy and torque, power, etc. An explanation of the National Electric Code Standards, including tables for copper wire, motor wiring, etc., is also given.

BOOKLETS, CATALOGS, Etc.

The Five Commercial Types of Synthetic Rubber. Synthetic Rubber Division, U. S. Rubber Co., 1230 Sixth Ave., New York, N. Y. 8½ x 11 in. 40 pp.

As indicated by the title, this booklet is devoted to a discussion of the five commercial types of synthetic rubber—Buna S, Buna N, neoprene, butyl, and Thiokol. Although originally compiled for the sales engineers of the company, it has been finally released for general distribution since it is an accurate statement of the overall synthetic rubber situation which is not only of value to the rubber industry but presented in such form that it can be understood by the layman. The booklet traces the development of synthetic rubber from laboratory beginnings, describes the properties of the commercial synthetics, and relates briefly the part played by U. S. Rubber in their development, manufacture and use in its own products. Of special interest in the booklet is a chart compiled from the experience of plants and laboratories of the company giving the relative physical and chemical properties of natural rubber and of the five types of synthetic rubber discussed.

•

Suprex Clay in Buna S. (Bulletin No. 1). J. M. Huber, Inc., 460 West 34th St., New York, N. Y. 8½ x 11 in. 16 pp.

This is the first of a planned series of technical bulletins on the application of Suprex Clay in the partial replacement of furnace black in Buna S (GR-S) stocks. The studies were undertaken with the primary object of extending the limited supply of furnace black of the semi-reinforcing type by partial replacement with a combination of easy-processing channel black, such as Wyex, and a hard clay, such as Suprex. Data is given on tensile strength, modulus, elongation, permanent set, hardness, resilience, tear resistance and other properties of various stocks. The current data indicates that with the exception of resilience, there is no significant change in any property when only 20% of the semi-reinforcing black is replaced. It also indicates that as much as 60% of such black can be replaced with improvements in many properties, particularly tensile, elongation and tear resistance.

•

The Phosphatides of Hevea Brasiliensis. By G. R. Tristram. British Rubber Producers' Research Association, 19 Fenchurch St., London, E.C. 3, England. 7 x 10 in. 8 pp.

This report, issued as Publication No. 23, and representing a reprint from *The Biochemical Journal* (Vol. 36, Nos. 3 and 4, pp. 400-405, 1942), is part of the investigation of the non-rubber constituents of latex launched several years ago by the B.R.P.R.A. The crude phosphatide was prepared by the method of Rhodes and Bishop (1931) and the preliminary treatment was carried out at the Rubber Research Laboratories in Ceylon. The method of treating the raw material is outlined in the report, the fractionation resulting in the isolation of a fairly pure form of phosphatidic acid, the possible source of which is discussed, and an impure form of lecithin. The lecithin fraction contained little or no kephalin, a finding which was unexpected.

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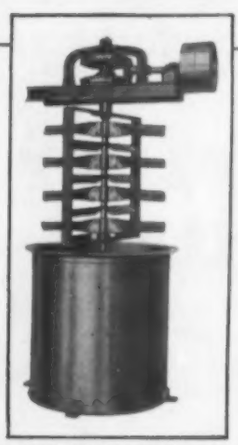
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Hard and Soft Kaolins of Georgia. By T. A. Klinefelter, R. G. O'Meara, G. C. Truesdell, and Sidney Gottlieb. Bureau of Mines, Washington, D. C. 8 x 10½ in. 20 pp.

Some of the properties of and the differences between the hard and soft kaolins (China clays) of Georgia are outlined in this report, the result of a study made under a cooperative agreement between the Bureau of Mines and the University of Alabama. The study was undertaken in the hope of discovering the best methods of beneficiating the hard clays to make them as usable as the soft types, the supply of which is being gradually depleted. Paradoxically, most of the clays called "hard" by the rubber industry are considered "soft" by clay producers. This is due to the fact that when a given clay is incorporated as a filler in a rubber compound which imparts hardness or stiffness to the compound, the clay is considered "hard" or "stiff." If, however, the resultant mixture tends to be soft or mushy, the clay is termed "soft." The report concludes that the beneficiation of the hard clays to the same grade as the soft may be accomplished by one of several types of milling.

•

Counterattack! By Myron M. Stearns. Automotive Safety Foundation, Tower Building, Washington, D. C. 8½ x 11½ in. 24 pp.

The answer to global warfare is continuous supply. Knowing this full well, the Axis, with Pearl Harbor, started an immense pincer movement, Japan driving toward the rubber-producing areas in the southwest Pacific while the German U-boat campaign against oil tankers in the Atlantic blazed to full fury. The effectiveness of that pincer movement is measured in this booklet by measuring the place of highway transportation in our war effort. The organized effort to "keep them rolling" is described by the author as the transportation "counterattack." The effectiveness of the Wartime Highway Traffic Program, launched by thirty-three national organizations, is described in some detail. This program embraces legislative action, motor vehicle administration, police control, engineering, training, and public participation. Advances along these lines are discussed.

•

Easy Processing Channel Black. (Chat No. 29). Binney & Smith Co., 41 East 42nd St., New York, N. Y. 8½ x 11 in. 6 pp.

Distinguishing differences between Standard Micronex, a good processing and fast curing black of the so-called medium type, and Micronex W-6, an easy processing impingement channel black, on the basis of tread type compounds made up with natural rubber and with Buna S (GR-S) are outlined in this technical report. The formulas employed are shown and properties are given for both the natural rubber and Buna S vulcanizates. While the data indicates that there is a clean cut difference between Stnadard Micronex and Micronex W-6, it also indicates that both of these types are not only much softer than the extra reinforcing or hard type blacks, but also noticeably softer than the average medium black.

•

Furnex. (Chat No. 30.) Binney & Smith Co., 41 East 42nd St., New York, N. Y. 8½ x 11 in. 10 pp.

The specific advantages of Furnex, a furnace type carbon black, in the compounding of the synthetic rubbers is detailed in this technical bulletin, all of the statements included being based on data developed in the research laboratories of the Colmubian Carbon Co. As compared to channel black, Furnex processes more easily and smoothly in synthetic stocks, permits higher loadings of pigment, withstands aging better and develops less hysteresis or heating. It is also more resilient and at high loadings shows greater extensibility. Electron photomicrographs of both Furnex and Micronex are shown.

Okonite Insulation. By H. C. Crafton, Jr., and E. D. Youmans, Okonite Co., Passaic, N. J. 8½ x 11 in. 36 pp.

The manufacture of rubber-insulated Okonite wire and cable is told—excellently told—in text and pictures in this booklet. It is traced from the receipt of Up River Fine Para, which the company considers the finest crude rubber for insulation, to the finished products, touching on compounding, calendering, processing of conductors (including insulating and vulcanization), vulcanization in continuous metal molds, and testing and further fabrication. The balance of the booklet describes to a large degree some of the conclusions reached by the company's technicians on accelerated aging and mechanical absorption tests as methods of determining the life and aging characteristics of rubber insulation. A few typical examples of Okonite products after years of service, giving tensile strength and elongation, are included.

•

The Elasticity of a Network of Long-Chain Molecules. I. By L.R.G. Treloar. British Rubber Producers' Research Association, 19 Fenchurch St., London, E.C. 3, England. 6 x 9½ in. 8 pp.

Reprinted from the *Transactions of the Faraday Society* (No. 258, Vol. 39, Part 1, January, 1943) and issued as Publication No. 30, this report critically examines the work of Kuhn (*Koll. Z.*, Vol. 68, p. 2, 1934; ibid, Vol. 76, p. 258, 1936) and Wall (*J. Chem. Physics*, Vol. 10, pp. 132, 485, 1942) who extended earlier treatment to a three-dimensional network of molecules in order to account for the properties of a rubber in bulk. The results of Kuhn and Wall, however, are not in agreement and the current report demonstrates the source of the discrepancies between their results.

•

Turgum—A Plasticizer and Tackifier for Buna S. J. M. Huber, Inc., 460 West 34th St., New York, N. Y. 8½ x 11 in. 6 pp.

The chemical composition, physical properties and compounding characteristics of Turgum, a standardized blend of the products obtained from the crude gum of the long leaf and slash pines, which has all the advantages of the crude gum with many of its disadvantages removed, are outlined in this bulletin. The properties imparted to Buna S (GR-S) compounds by this new material are shown, the outstanding property being resistance to cut growth. Test results of a tread compound containing 10 parts of Turgum are compared with one having a similar amount of coal tar type softener.

•

Doall Contour Saws. Doall Service Co., Des Plaines, Illinois. 6 x 9 in. 265 pp.

Doall Contour Saws are used for the shaping of all basic materials, from ferrous and non-ferrous metals and alloys to sponge rubber. This book, a combination catalog and text book, covers the art of contour machining, its cutting tools, and the Doall training program. The latest techniques for contour machining, including internal and external three-dimensional parts for "short run" forgings, are outlined. A number of case histories stressing the economies gained from adoption of contour machining equipment are given.

•

Report on the Rubber Industry in Canada; 1941. Published by the General Manufactures Branch, Census of Industry, Dominion Bureau of Statistics, Department of Trade and Commerce, Ottawa, Canada. 8½ x 11 in. 13 pp. 25c.

As indicated by the title, this publication gives statistics pertaining to the Canadian rubber industry for the year of 1941. It is primarily composed of tables giving factual data, such as capital invested, number of employees, salaries and wages, cost of materials used, gross value of production. Specific statistics on tires and tubes and footwear are given. A list of Canadian rubber manufacturers is included.

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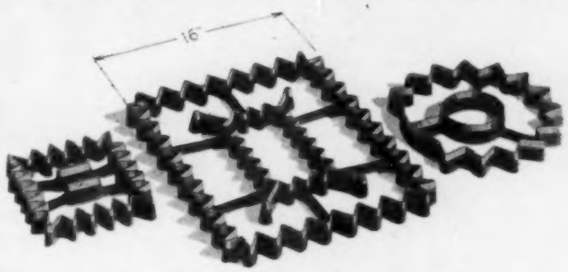

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NEW YORK, MAY 15, 1943

Crude Rubber

AS a result of an extended trip through Latin American countries, Dr. E. W. Brandes, head pathologist in charge of rubber plant investigations for the Bureau of Plant Industry of the U. S. Department of Agriculture, has expressed complete confidence that in time the Tropical Americas will be able to furnish tremendous supplies of crude rubber. Dr. Brandes was particularly impressed with advances made in the combatting of the South American leaf blight, which so seriously impeded early plantation efforts in that country.

Brazil continues to hold attention as the leading supplier—and potential supplier—of rubber to the United States. At least another 10,000 tappers have been sent into the rubber-producing areas under the program which provides for the production of at least 50,000 tons of rubber this year, approximately 35,000 tons of which will be earmarked for delivery to this country. Stores supplying food and other essentials to the tappers are being financed by the Rubber Development Corp. to eliminate exploitation by traders in Para and Manaos. All supplies will be sold on a non-profit basis. Reports of landing tappers in remote jungles by parachute have been revealed as a hoax.

Good reports also emanate from other Latin American countries. Operations have been started in the Madre de Dios region of Peru. A 2,000-acre plantation has been started at Quevedo in Ecuador. Three plantations are already under way in Colombia. At least 25 nurseries are now operating in Guatemala. Mexico has shipped another 1,200 tons of rubber to this country. Progress in the combatting of malaria and other diseases is reported on all sides. Such progress is indicative of increased rubber shipments in the near future.

Because of the accounting difficulties presented in selling rubber to manufacturers in the United States on a dual basis, the Rubber Reserve Co. has adjusted its selling methods. Crude rubber, guayule and latex will henceforth be sold on a conditional price basis (set forth in Circular No. 17 as rubber for "Civilian Use"), and adjustments in the price of any rubber used for "Other than Civilian Use" will be made monthly. The new procedure is outlined in Circular No. 20.

Prices shown below are those set by the Rubber Reserve Company:

	C	N-C
Plantations—		
Ribbed Smoked Sheets, 1X	22½	40
Thick Pale Latex Crepe, 1X	22½	40
Thin Pale Latex Crepe, 1X	22½	40
Thick Brown Crepe, 1X	21⅜	38⅞
Thin Brown Crepe, 1X	21⅜	38⅞
Thick Remilled Blankets, #1	21⅜	38⅞
Rolled Brown or Flat Bark	18	35½
Smoked Blankets, #1	21⅛	38⅜
Claro Brand 1XRSS	22½	40
Sole Crepe Trimmings	22	39½
Sole Crepe	22½	40
Wild—		
Uncut Fines, Curde	15	29
Cut Fines, Crude	15½	29¾
Cut Fines, Washed & Dried	22½	40
Upriver Coarse, Crude	12⅝	26⅛
Upriver Coarse, Washed & Dried	20¼	37¾
Caucho Ball, Crude	11⅝	24¾
Caucho Ball, Washed & Dried	19½	37
Guayule—		
Carload Lots	17½	31
Less than Carload Lots	18	31½
Balata—		
Surinam Sheet	42½	42½
Manaos Block	38¾	38¾
Colombian Block	38¾	38¾
Peruvian Prime	38¾	38¾
Chicken Wire	23¼	23¼
Latex—		
Normal, Tank Car Lots	26	43½
Creamed, Tank Car Lots	26¾	44¼
Centrifuged, Tank Car Lots	27¾	45¼
Heat-Concentrated, Carload Drums	29½	47

C, for Civilian Use; N-C, for Non-Civilian Use.

Scrap Rubber

Scrap rubber supplies are plentiful at this writing and from all appearances that situation will continue for some time to come. Although agents of Rubber Reserve began to turn down some types of scrap collected during the nation-wide collection campaign, appeals to officials of the Government agency resulted in the announcement that purchases will continue to avoid hardships on the collectors. An amendment to RPS 87 provides that hard rubber scrap is to be priced under the General Maximum Price Regulation in the future. Prices shown below are ceilings on typical scrap grades:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$18.00
Beadless truck tires	ton	24.00
Mixed truck tires	ton	18.00
Beadless passenger tires	ton	24.00
No. 1 passenger peelings	ton	47.50
No. 1 truck peelings	ton	47.50
No. 2 passenger tubes	lb.	.07¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06¾
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.05¼
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41
CHAFERS			
Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@ 7.818
40x40	36 in.	6.15	lb.	—	@ 6.991
40x36	36 in.	6.50	lb.	—	@ 6.615
48x48	40 in.	2.50	lb.	—	@16.200
48x48	40 in.	2.85	lb.	—	@14.210
56x60	40 in.	3.60	lb.	—	@11.944
48x44	40 in.	3.75	lb.	—	@11.066

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

Cotton

Although the price of middling uplands on the Cotton Exchange swung in the comparatively narrow range of 35 points since our last report, it has developed a serious downward trend in the past several days. High for the period was 22.08 on April 20 and low 21.73 on May 14 and 15. The average price for the month of April was 22.02, based on 25 trading days. The price hovered around 22 cents in mid-April, with the eyes of the industry trained on Washington. Activities were generally restricted in anticipation of an announcement covering ceiling prices of cotton. Discussion of such ceilings (at least at this writing) seem to have been indefinitely postponed while OPA officials study other possible methods of controlling cotton prices. The downward trend which has developed in the past few days is attributed largely to the better war news, particularly the complete defeat of the Axis armies in Africa, favorable crop weather, and a spurt in hedging, which is still continuing. The latest private estimate of acreage planted or to be planted to cotton this spring is set at 22,903,000 acres, which compares with 23,270,000 estimated a month ago and with 23,310,000 reported by the Government to have been in cultivation on July 1, 1942. This estimate represents a reduction of 407,000 acres from the area sown last year. Quotations for middling uplands on the Exchange follow:

	April 10	May 15		
	Close	High	Low	Close
July	19.87	19.90	19.71	19.74
October	19.67	19.68	19.44	19.50
December	19.62	19.51	19.29	19.38

Reclaimed Rubber

Although it was first believed that the cancellation of the all-reclaim Victory tire program would result in a materially lessened demand for reclaim, the increased demand for camelback has caught up the lag with the result that demand continues on the same high plane as heretofore. The production of reclaim is still inadequate to meet total demand, and reclaimers are pushing their equipment to capacity. The supply situation, fortunately, is excellent and no trouble is anticipated from this quarter for some time to come. The manpower situation has eased slightly, but is expected to present further difficulties within the next few months when the drafting of fathers begins. Although rubber workers are on the so-called "exempt" list, final decisions are left to local Selective Service boards. Prices shown below are ceilings on typical reclaim grades:

Shoe				
Unwashed	lb.	.07	@	.07¼
Tube				
Black Tube	lb.	.11¼	@	.11½
Red Tube	lb.	.12	@	.12¼
Tires				
Black (acid process)	lb.	.07½	@	.07¾
Black, selected tires	lb	.06½	@	.06¾
Truck, Heavy Gravity	lb.	.08½	@	.08¾
Miscellaneous				
Mechanical blends	lb.	.04½	@	.05½
White	lb.	.13	@	.13¼

Ducks

Enameling (single filling)	lb.	— @	.44¼
Belting and Hose	lb.	— @	.39
Single filling, A grade	lb.	— @	.19½
Double filling, A grade	lb.	— @	.20¾

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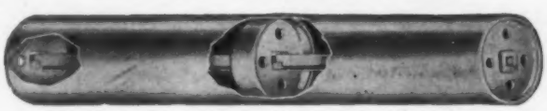

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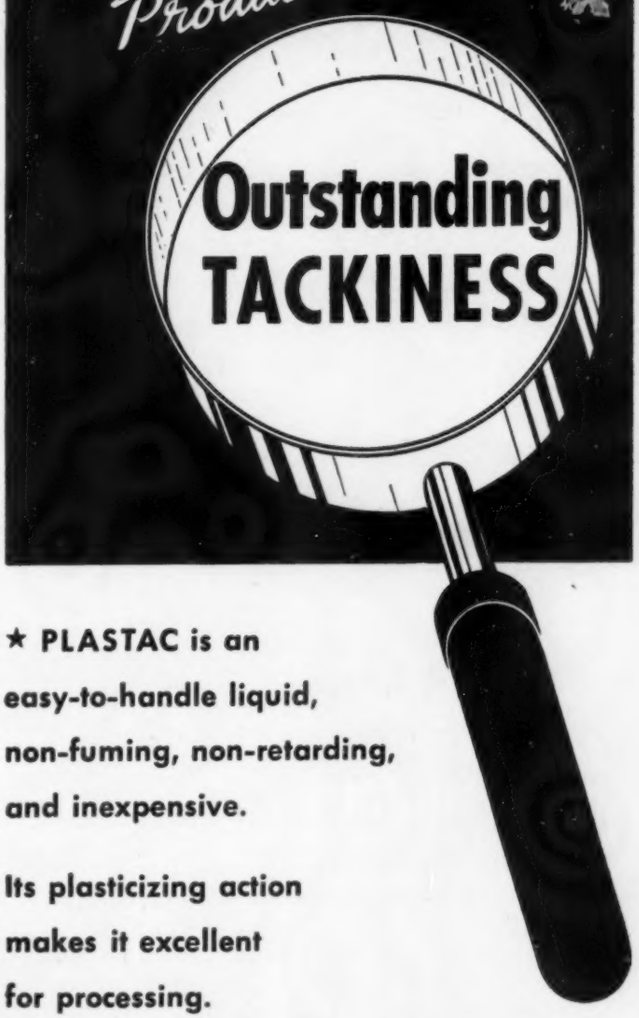

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CHEMICAL MARKETS

New York, May 14, 1943
All Prices F.O.B. Works

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.28 @	.33
A-10	lb.	.36 @	42
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.60 @	.70
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.43 @	.45
Beutene	lb.	.59 @	.64
B-J-F	lb.	.38 @	.43
Butyl Zimate	lb.	— @	1.13
Captax	lb.	.38 @	.40
Crylene	lb.	.40 @	.47
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.36
El-Sixty	lb.	.40 @	.47
Ethyl Zimate	lb.	— @	1.13
Ethylidine aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.31 @	—
Guantal	lb.	.40 @	.50
Hepteen	lb.	.34 @	.39
Hexamethylenetetramine	lb.	.33 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.15 @	—
Ledate	lb.	— @	1.48
Methyl Tuads	lb.	— @	1.53
Methyl Zimate	lb.	— @	1.23
Monex	lb.	— @	1.53
Pentex	lb.	.74 @	.84
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	— @	1.65
R & R 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-2 Crystals	lb.	1.55 @	1.70
Rotax	lb.	.48 @	.50
Safex	lb.	1.15 @	1.25
Selenac	lb.	— @	1.25
SPDX	lb.	.70 @	.75
Super-Sulfur No. 2	lb.	.13 @	.15
Thiocarbanilid, drums	lb.	.28 @	.33
Thiurad	lb.	— @	1.55
Trimene	lb.	.54 @	.64
base	lb.	1.03 @	1.18
Triphenylguanidine	lb.	.45 @	—
Ulto	lb.	1.25 @	1.75
Ureka	lb.	.50 @	.75
Blend B	lb.	.50 @	.57
Blend C	lb.	.48 @	.55
Vulcanex	lb.	.42 @	.43
Vulcanol	lb.	.85 @	—
Inorganic			
Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Next Column)			
Blues [b]			
Prussian	lb.	.36 @	—
Ultramarine	lb.	.17 @	.27
Browns [b]			
Mapico	lb.	.1135@	—
Umber, Turkey	lb.	.04¾ @	—
Greens [b]			
Chrome	lb.	— @	.25
Guignet's Green	lb.	.70 @	—
Reds			
Antimony crimson, 15/17	lb.	— @	—
Antimony sulfur, free	lb.	— @	—
Indian	lb.	.08¾ @	—
Domestic (Maroon)	lb.	.11 @	—
Mapico	lb.	.096 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red	lb.	.09¾ @	—
Whites [b]			
Cryptone No. 19	lb.	.0560@	.0585
Cryptone CB No. 21	lb.	.0560@	.0585
Cryptone ZS-800	lb.	.0825@	.0850
Lithopone:			
Albalith	lb.	.04¼ @	.04½
Astrolith	lb.	.04¼ @	.04½
Azolith	lb.	.04¼ @	.04½
Ray-cal	lb.	.05½ @	.05¾
Rayox	lb.	.14½ @	.15¾
Titanox A	lb.	.14½ @	.14¾
Titanox B	lb.	.05¾ @	.06
Titanox C	lb.	.05½ @	.05¾
Zinc Oxide—American Process [b]			
American Azo: ZZZ (lead free)	lb.	.07¼ @	.07½
Anaconda, lead free	lb.	.07¼ @	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼ @	.07½
XX Red—4	lb.	.07¼ @	.07½
XX Red—72	lb.	.07¼ @	.07½
XX Red—103	lb.	.07¼ @	.07½
Kadox, black label—15	lb.	.07¼ @	.07½
Red label—17	lb.	.07¼ @	.07½
St. Joe, black label	lb.	.07¼ @	.07½
green label	lb.	.07¼ @	.07½
red label	lb.	.07¼ @	.07½
U. S. P.—7, bbls.	lb.	.10½ @	.10¾
Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½ @	.09¾
Green seal—8	lb.	.09 @	.09¼
Red seal—9	lb.	.08½ @	.08¾
Yellows [b]			
Cadmolith	lb.	.55 @	.60
Chrome	lb.	— @	.50
Mapico	lb.	.071 @	—

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

BLACKS
(In bags, carload lots)

Aerfloted Arrow		.0355@	—
Certified		.0355@	—
Certified Spheron		.0355@	—
Channel "S"		.12 @	—
Continental		.0355@	—
Disperso		.0355@	—
Dixiedensed		.0355@	—
Dixiedensed 66		.0355@	—
Excello		.0355@	—
Furnex		.03½@	.06
Furnex Beads		.03½@	.06
Gastex		.03½@	.06
Kosmobile		.0355@	—
Kosmobile 66		.0355@	—
Kosmos-Dixie 20	lb.	.03½@	.06
Micronex (Amarillo)		.0355@	—
Micronex Beads (Amarillo)		.0355@	—
Pelletex		.03½@	.06
P-33		.0475@	—
Shell Carbon (Del. Midwest)		.025 @	—
Sterling		.035 @	—
Supreme		.0355@	—
Thermax		.0225@	—
Thermax "S"		.0675@	—
Wyex		.0355@	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	18.00	@24.50
99½%-300	ton	—	@16.50
86-90%-300	ton	—	@13.50
Asbestine	ton	16.50	@20.00
Atomite	ton	—	@27.50
Barium carbonate (98-100%)	ton	47.00	@49.00
Barytes	ton	25.35	@36.00
Bentonite	ton	11.00	@16.00
Blanc fixe, dry	ton	60.00	@67.50
Calcene	ton	37.50	@43.00
Catalpo (fact)	lb.	.02 @	—
Chalk, precipitated			
Suprex white	ton	32.50	@45.00
Clay, Aerfloted, Suprex	ton	10.00	@22.50
Aerfloted Paragon	ton	10.00	@22.50
Crown (f.o.b. plant)	ton	11.00	@ —
Dixie	ton	—	@10.00
Kaolloid	ton	—	@ 9.00
Langford	ton	—	@ 8.50
McNamee	ton	—	@10.00
Par	ton	—	@10.00
Witco	ton	10.00	@ —
Cotton Flock (Dark)	lb.	.10½ @	.13
Kalite No. 1	ton	—	@26.00
Kalite No. 3	ton	—	@36.00
Kalvan	ton	—	@100.00
Kalvan "S"	lb.	— @	.09½
Keystone white	ton	—	@14.00
Magnesium carbonate	lb.	.06¾ @	—
Mineralite	ton	—	@30.00
Pyrax A	ton	—	@ 7.50
Rottenstone (powd. Dom.)	ton	25.50	@37.50
Rubberol	lb.	— @	.17½
Silene (calcium silicate)	lb.	.04 @	.045
Snowflake white	ton	—	@16.00
Starch, powdered	cwt.	2.90	@ 4.10
Talc, domestic	ton	17.00	@25.00
Whiting, commercial	ton	16.00	@26.00
Columbia Filler	ton	9.00	@14.00
Witco	ton	6.00	@ —
Wood Flour (100 mesh)	ton	30.00	@32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00	@ —
Black Diamond	ton	25.00	@ —
Hard Hydrocarbon	ton	25.00	@27.00
MilliMar	lb.	— @	.05½

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00 @	4.50
Rodo #10	lb.	5.00 @	5.50
Curodex 19	lb.	2.75 @	—
Curodex 188	lb.	3.50 @	—
Curodex 198	lb.	4.50 @	—
Para-Dors	lb.	4.50 @	—
Aresklene No. 375	lb.	.35 @	.50
Darvan (dispersing agent)	lb.	.30 @	.34
Santomerse S	lb.	.11 @	.25
Sponge Paste	lb.	— @	.18
Sunproof	lb.	.22¾ @	.27¾
Tackol (tackifier)	lb.	.085 @	.18
Tonox	lb.	.50 @	.59
Ty-Ply	gal.	6.75 @	8.00
Unicel (blowing agent)	lb.	.50 @	—

SOFTENERS

Acids			
Acetic, 28%, bbls. [a]	100 lb.	3.38 @	3.63
Nitric, 36 degrees	cwt.	5.00 @	—
Acids, Fatty			
Laurex	lb.	.14¾ @	.17¼
SL #10	lb.	.12 @	.14
Stearex Beads	lb.	.10 @	.11
Stearite	lb.	.10 @	—
Alkalies			
Caustic Soda, 76%	cwt.	2.70 @	5.70
Soda Ash, 58%	cwt.	1.15 @	2.95
Oils			
Cycline Oil	gal.	.14 @	.20
Degras, bbls.	lb.	.10 @	.12
Para-Flux	gal.	.17 @	.18
Para-Lube	lb.	.046 @	.048
Petrolatum, amber [b]	lb.	.033½ @	—
Pigmentaroil, tank cars	gal.	.20½ @	—
in drums	gal.	.26½ @	.27½
Pine, tanks	gal.	.55 @	—
Rosin Oil, cmpd.	gal.	.40 @	—
Rubberol	lb.	.13½ @	.14
Rubtack	lb.	.10 @	—
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	— @	—
Witco Softener No. 20	gal.	.20 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06 @	—
coal tar	ton	19.00	@22.00
hardwood	ton	16.00	@22.50
pine, 200 lb. gr. wt.	bbl.	— @	4.50
Pigmentar, tank cars	gal.	.20½ @	—
in drums	gal.	.26½ @	.27½
Retort Pine Tar, drums	gal.	.26½ @	.27½
Solvents			
Acetone, pure [a]	lb.	.07 @	—
Benzene, 90%, tank car	gal.	.14 @	—
Beta-Trichlorethane	gal.	— @	.20
Bondogen	lb.	.98 @	1.05
Carbon, bisulfide	lb.	.05 @	.08½
Carbon tetrachloride	gal.	.83 @	1.27
Dichlorethylene	lb.	— @	—
Dipentene, cml., drums	gal.	.48 @	.50
Ethylene dichloride	lb.	.07½ @	.08½
Plastogen	lb.	.07¾ @	.08
Reogen (drums)	lb.	.11½ @	.12
Rub-Sol	gal.	.09½ @	—
Trichlorethylene	lb.	.08 @	.09½
Turpentine, spirits	lb.	.78½ @	—
dest. dist., drums	gal.	.50 @	.55
Waxes			
Beeswax, white [b]	lb.	.58 @	—
Carnauba, yellow [b]	lb.	.83¼ @	—
Ceresin, white, dom.	lb.	.13½ @	.15
Montan, crude	lb.	— @	—
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04¼ @	—
Refined, 123/125	lb.	.05¾ @	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.95 @	2.05
Gel	lb.	.52 @	.54
Hipar	lb.	.61 @	.63
Powder	lb.	.43 @	.45
Resin	lb.	.43 @	.45
Resin D	lb.	.43 @	.45
White	lb.	1.23 @	1.33
Albasan	lb.	.69 @	.74
Antox	lb.	.54 @	.56
B-L-E	lb.	.43 @	.52
Flectol H	lb.	.52 @	.65
Flectol White	lb.	.90 @	1.15
Neozone A, B, C, D, E	lb.	.43 @	.63
Oxynone	lb.	.77 @	.90
Retardex	lb.	.45 @	.48
Santoflex B	lb.	.52 @	.65
Santovar A	lb.	1.15 @	1.40
S.C.R.	lb.	.33 @	.35
Stabilite	lb.	.52 @	.54
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.43 @	.52

EXTENDERS

Naftolen	lb.	.15 @	.25
Vanzak	gal.	.05 @	.06

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35 @	.50
Cocoa Soapstock	lb.	.06 @	.08
Colite	gal.	.90 @	1.15
Dipex	lb.	.06 @	.08
Glycerized Liquid Lubricant	gal.	— @	1.35
Lubrex	lb.	.25 @	.30
Mineralite	ton	— @	30.00
Mold Paste	lb.	.12 @	.18
Sericite	ton	65.00	@75.00
Soap Tree Bark, cut, sifted	lb.	.06 @	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25 @	—
Amberex Type B	lb.	.18¾ @	—
Black	lb.	.08½ @	.13
White	lb.	.09 @	.15
Brown	lb.	.10 @	.14
Neophax A	lb.	.16½ @	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08 @	.12
Sulfur Chloride, yellow (drs.)	lb.	.03 @	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.55 @	—
Commercial (bags)	cwt.	2.20 @	—
Telloy	lb.	1.75 @	—
Vandex	lb.	1.75 @	—

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BELLEVILLE, N. J.

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Easy to apply, water-repellent, non-flammable, Johnson's Wax Finishes are valuable allies for the manufacturer of rubber goods. They retard oxidation, the destroyer of rubber, and add a lustre which improves the appearance of the finished products.

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